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MASTER OF SCIENCE

Parental intentions to provide healthy diets for pre-school children

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Parental intentions to provide healthy diets for preschool children

Sheela Tripathee

2014

University of Dundee

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**Parental intentions to provide healthy diets
for pre-school children**

A thesis submitted for the degree of

Master of Science

in the

School of Dentistry

University of Dundee

Sheela Tripathee (BA Hons)

May 2014

Declaration

I declare that I am the author of the thesis and all references cited have been consulted by myself. I completed the thesis and it has not been previously accepted for a higher degree.

A handwritten signature in dark ink, consisting of a large, stylized initial 'S' followed by a series of connected loops and a long horizontal stroke extending to the right.

Sheela Tripathee

29 May 2014

Abstract

The aim of this thesis was to investigate the factors that influence parental intention to provide their children with healthier diets.

The study was conducted in three phases. Firstly, a two-part structured literature review was carried out. The review explored the influences on family and children's diet using an ecological model. The second part reviewed the behavioural and psychological theories employed in studies related to parental behaviour for their children. The findings identified global, social and personal factors that influenced family-food environment and children's diet. The theory of planned behaviour was identified as the most suitable model to examine the factors influencing parental behavioural intention to provide their children with healthier diets.

The second phase explored qualitatively the factors influencing family and children's diet. In-depth interviews were conducted with 15 parents living in different areas within NHS Tayside. The results revealed that various social and psychological factors influence the family food environment and parents' food choices. The findings from the first and second phases of the study informed the design of the third phase.

The third phase used the theory of planned behaviour to investigate the influence of attitude, subjective norm, perceived behavioural control, moral norm and nutrition knowledge on parental intention to provide their children with healthier diets. Parents (n=102) from areas with level of varying social deprivation participated. The results indicated that parental intention was positively predicted by attitude and moral norm. Subjective norm, perceived behavioural control and nutrition knowledge were not significant in predicting parental intention.

This thesis concludes that parents have positive attitudes towards providing a healthy diet for their children and they intend to do so. From the findings of this thesis it may be suggested that interventions aimed at improving children's diet could benefit from addressing the gap between intention and behaviour, perhaps through addressing the cost of healthier foods, sociocultural food practices and work-life balance policies.

**TO,
Buwa and Mommy**

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Section 1

Introduction

Section 1: Introduction

The diet that people consume determines to a large extent their health, growth and development (WHO, 2006). It is established that eating habits and food preferences acquired during childhood persist into adulthood (Nicklaus et al., 2005). Eating a healthy and balanced diet is considered to be an essential component of healthy living. Conversely, the consumption of an unhealthy and unbalanced diet, consisting of both under and over-nutritious foods, has been related to health problems such as for example, obesity and poor oral health (Gross et al., 2004; Hayden et al., 2013; Kavey, 2010; Latini et al., 2006; Marshall et al., 2007). In particular, it is widely recognised that higher intakes of free sugars or non-milk extrinsic sugars (NMES) and saturated fats reduce the nutrient quality of diets by providing significant energy without specific and important nutrients (Gibson, 1997). In developed and industrialised nations, there is an abundance of energy-dense foods lacking in nutritional value (WHO, 2003). Furthermore, in countries undergoing rapid economic development and industrialisation of agriculture, such as intensive cattle production, there is increased consumption of animal products resulting in higher intakes of saturated fats (WHO, 2003). Studies show that “energy-dilute” foods, such as fruits and vegetables, have high water content and contain nutrients that are vital for healthy growth and development (Wardle, 1995, 2007; WHO, 2003)

High intake of energy-dense foods, such as those high in fat and refined sugars, are associated with increased weight gain (Swinburn et al., 2004) and dental caries (Sheiham, 2001). With regard to dental caries it is the cariogenicity of NMES that is known to affect dental decay experience as sugar is metabolised by *Streptococcus mutans* creating lactic acid which causes damage to teeth known as caries (Maguire and Rugg-Gunn, 2003). The Committee on Medical Aspects of Food and Nutrition Policy (COMA, 2000) suggested that NMES i.e. milk sugars (e.g. lactose) and sugars within cell walls (e.g. fructose) are less cariogenic than NMES (e.g. sucrose). The increased and frequent consumption of NMES is therefore the predominant aetiological factor in dental caries. Epidemiological work from Japan (Shimamura, 1974; Takeuchi, 1960, 1961) has shown that a dose-response curve exists in which small increases in total refined sugar consumption beyond 15 kg/person/year causes large increases in dental

caries experience. Sreebny's (Sreebny, 1982) work further showed that increased frequency together with the maturity of the teeth. Therefore, for smaller overall amounts of NMES taken more frequently in children with newly erupted teeth would increase the child's likelihood of having tooth decay (Newbrun, 1982).

Increased consumption of energy-dense and nutrient poor foods and drinks resulting in overweight and obesity have been linked with Type 2 diabetes as well as chronic diseases such as cancer (AICR, 1997; NRC, 1989). Unhealthy diets that are associated with excessive consumption of saturated fats, cholesterol and salts, combined with low fibre intake, are known to result in high blood pressure and dyslipidemia. Poor diets are also linked to cardio-vascular disease and chronic kidney disease (Bazzano et al., 2002). Therefore, assisting people manage their dietary habits offers potential for prevention of multiple diseases within the framework of a common risk factor approach (Sheiham and Watt, 2000).

The Scottish Context

According to the Scottish Health Survey (SHS) 2011, less than 13% of 2-15-year-olds eat the recommended intake of fruit and vegetables, and the majority of children eat more salt, sugar and saturated fats than is recommended. Forty nine per cent of Scottish children eat sweets or chocolates at least daily, and 43% drink carbonated sugar sweetened drinks (BMA, 2007). The SHS (2011) revealed that more than 31% of this age group of Scottish children are overweight or obese. More than 33% of Scottish children have dental caries by the age of 5 years (NDIP, 2012).

The need to address dietary habits to promote healthier lifestyles for Scottish children is important with regard to the prevalence of dental caries, obesity and obesity-related diseases (e.g. cardio-vascular disease). The SHS 2011 also showed that social deprivation was one of the factors influencing health in the Scottish population. If health inequalities are to be addressed then there is a need to understand how dietary habits are formed and maintained in order to make recommendations for the promotion of healthier dietary habits for Scottish children now and in the future.

Studies show that parents can significantly influence young children's diet and food habits by providing certain foods and by establishing healthier food environments

in the family (Campbell et al., 2007; Lewis and Worobey, 2011). It is therefore important to understand better parental behaviour with regards to their family food in order to improve children's diet.

An exploration of parental behaviour and intentions in relation to family food environment and children's diet in particular is the subject of this thesis, which uses a mixed methods approach.

The overall research question is therefore:

'What factors influence parents' intention to provide their children with healthier diets?'

The aim of the thesis is:

To investigate the factors that influence parents' intention to provide their children with healthier diets.

The research question and aim are addressed through seven research objectives. These are:

1. To conduct a narrative review to examine the factors influencing parents' intention to provide their children with healthier diets and to explore behavioural theories used to predict parents' behavioural intention in relation to their children using a structured approach.
2. To explore qualitatively the social and psychological factors that influence parents' intentions to provide their children with healthier diets.
3. To examine parental behavioural intentions to provide their children with healthier diets within the framework of the theory of planned behaviour.
4. To examine the attitudes and beliefs of parents with regard to their intention to provide their children with healthier diets.

5. To examine the subjective norms and moral norms of parents with regard to their intention to provide their children with healthier diets.
6. To investigate the behavioural control (self-efficacy) of parents with regard to their intention to provide their children with healthier diets.
7. To examine the effect of external variables (e.g. demographic and dietary knowledge) of parents with regards to their intention to provide their children with healthier diets.

To achieve the aim and objectives, the research in this thesis was conducted in three stages, which are discussed below (Sections 2, 4 and 5). The thesis is divided into the following sections:

- Section 2 presents the literature review, which investigated factors influencing parents with regards to the family diet together with the behavioural and psychological theories used in this context. Findings from this review informed the design of the qualitative and quantitative studies in Sections 4 and 5.
- Section 3 presents the purpose of the thesis and the research aims and objectives.
- Section 4 is a qualitative study exploring parents' views regarding their family food environment and household diet. The purpose of the qualitative study was to explore the components of global and social environments such as media, cost of food, food background, work and life balance (external factors) that might influence parental dietary behaviours and choices. Personal (internal) factors that may influence dietary behaviour and affect food choices such as belief and attitudes, control and confidence, meal routine were also explored. Findings from this study informed the questionnaire design for the (TPB) study in Section 5.

- Section 5 presents a quantitative study, using the theory of planned behaviour to investigate the factors influencing parental intention to provide their children with a healthy diet.
- Overall conclusions of the thesis and recommendations are presented in Section 6.

Section 2

Literature review

Section 2: Literature review

2.1 Overview of the literature review

There are many factors that influence children's dietary behaviours, food choices and intake (Campbell et al., 2007; Patrick and Nicklas, 2005). Children's eating patterns and habits are influenced by both the physical environment in which they reside and their psychosocial environment. At the physical environment level children are more likely to eat foods that are readily available and easily accessible to them. It has been observed that children will eat greater quantities when they are presented with larger portion sizes (Orlet Fisher et al., 2003). The psychosocial environment, as determined by socioeconomic and sociocultural factors, such as parents' education, time constraints, and ethnicity, are also known to influence the types of foods and drinks consumed by children (Kahlor et al., 2011; Moser et al., 2012). Household routines, which include mealtime structures, families eating together or viewing television during mealtimes, are known to be important psychosocial influences, which may affect children's eating habits. Studies have suggested, therefore, that parents play a vital role in the development of their child's food preferences and dietary habits (Brown et al., 2008; Clark et al., 2007; Freeman et al., 2005; Salt et al., 2005; Scaglioni et al., 2008).

The role that parents have in influencing their children's diets is also affected by the socioeconomic dimension of their psychosocial environment. Parents, for instance, will buy affordable foods, which are high in fats and sugars, since these provide a ready and cheap source of calories. As Cole-Hamilton et al. (Cole-Hamilton et al., 1986) have pointed out, the unassuming advice to throw away the frying pan, for a family living in poverty, would have increased the costs of the food bill from between 12p to £2.05 per person per week in 1986. Therefore, parents influence their children's eating habits directly through the foods they can afford to buy and the need to make calories readily available for their families (Andrews et al., 2010).

At the psychosocial level, parents influence dietary habits through a process of primary socialisation (Baric, 1979). Primary socialisation may be thought of in terms of modelling behaviours, parenting styles, and the incorporation of parental attitudes into the child's behaviour. In particular, mothers play a powerful role in developing the healthy eating habits of young children (Jones et al., 2010; Patrick and Nicklas, 2005;

Vereecken et al., 2008). An additional factor related to primary socialisation is parents' own food preferences, which are internalised by the child as their own.

In considering the role of parental food choice and dietary habits, several studies have suggested that changing parents' own dietary behaviours would assist in modifying their children's food intake (Spruijt-Metz et al., 2002), and meet the challenges of promoting healthy eating in children in the current eating and socioeconomic environment (Scaglioni et al., 2008). Consequently, when thinking about the determinants of children's food choices it is necessary to examine the factors that influence parents' food attitudes, dietary choices and their intentions to provide healthier diets for their children and families. If Scottish families in general, and children in particular, are to have healthier diets, then it is crucial to understand the physical (external) and psychological determinants of parental food choices with regards to the provision of recommended healthy foods and drinks.

These multiple factors play significant roles in parents' and caregivers' intention to provide their children with the recommended healthy diet. Studies have identified various psychosocial determinants that are different in their nature, level of influence and background. While some of the common factors that influence parents are environmental and circumstantial, others can be internal and individual to certain parents. It is proposed that it is within the environment that the family resides, in its greatest sense, that parents, through a process of primary socialisation, remain the most influential with regards to their children's dietary behaviours.

Studies have reported that the environmental context, social networks and psychological factors provide a theoretical framework from which parental intentions and behaviours may be examined (Mobley et al., 2009). Therefore, to understand parental intentions to provide a healthier diet for their children, it is necessary to investigate a range of influences. These include the physical (external) environment as well as the food environment, socioeconomic status and cultural background of the family, parents' level of education, employment status, the influence of significant others, parental self-efficacy as well as parents' nutrition knowledge, attitudes and beliefs towards healthy eating (Burnier et al., 2011; Gillespie and Achterberg, 1989; Haerens et al., 2009; Kahlor et al., 2011; Mazur et al., 2003; Moser et al., 2012; Tucker and Sanjur, 1988). An appreciation of the determinants of parents' intention to provide

a healthier diet for their children will assist in making recommendations for the promotion of healthier eating interventions for parents and their children.

2.2 Aim of the literature review

The aim of the narrative review is two-fold. First, it will examine the literature to identify external environmental and psychosocial factors that influence parents' behavioural intentions to provide their children with the recommended healthy diet. Secondly, it will review theories of health behaviour. An overview of behavioural theories to identify the most suitable to examine parents' intentions to provide their children with the recommended healthy diet will be presented. For the purpose of this review and thesis, the recommended healthy diet consists of different types and proportions of food needed for a balanced and healthy diet. The Food Standard Agency (FSA, 2007) has developed 'The eatwell plate' as shown in Figure 2.1. The eatwell plate recommends that a balanced diet consisting of different kinds of nutrients is necessary. It advises eating a balanced diet, avoiding sugary food and drinks that contains a lot of calories with little nutritional value and eating plenty of fruit and vegetables.

Figure 2. 1 The eatwell plate



(FSA, 2007)

2.3 Factors influencing parents' intentions to provide the recommended healthy diet for their children.

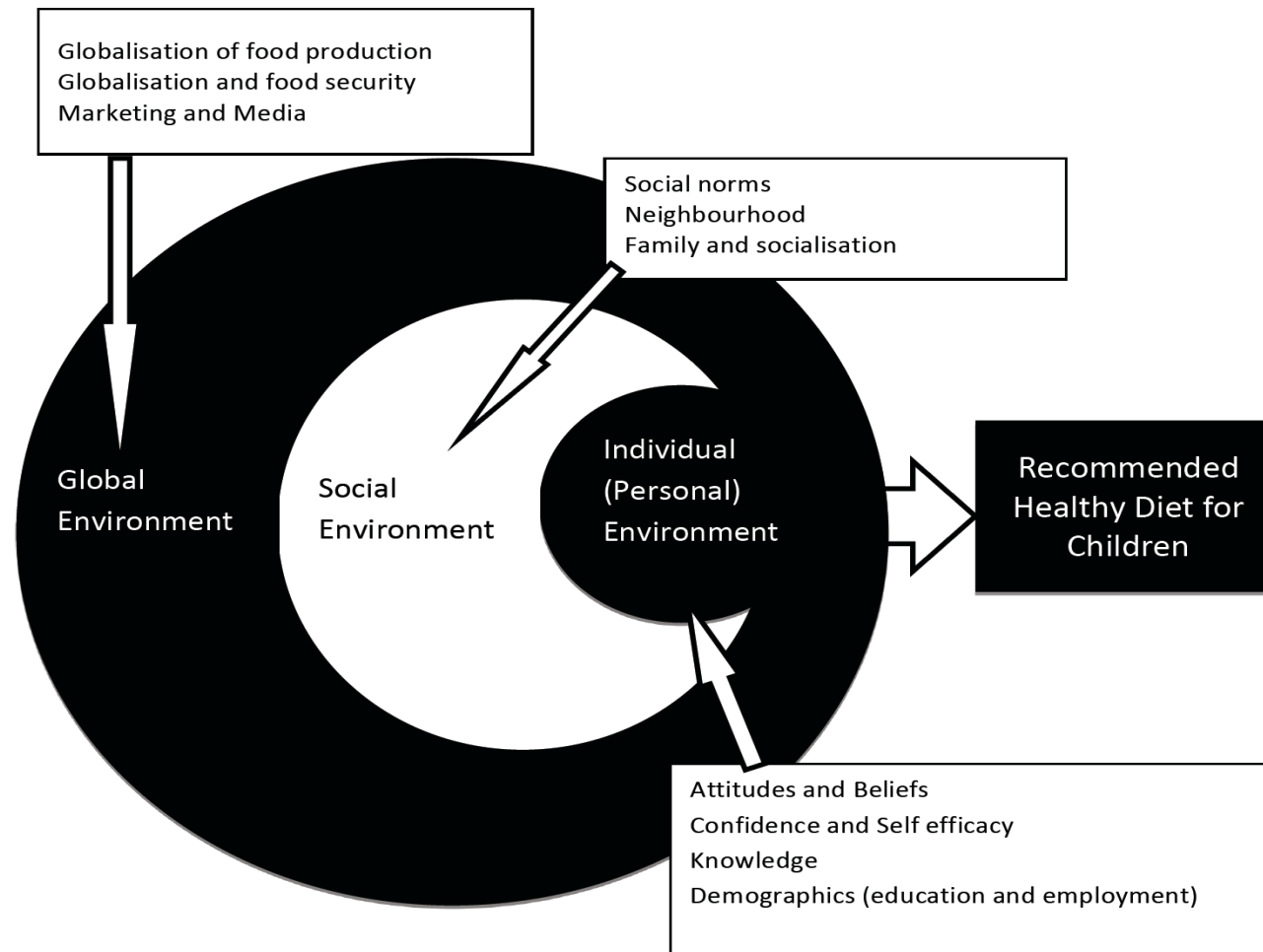
The first part of the literature review will unpick the determinants of dietary behaviours and relate these factors to parental intentions to provide a healthy and recommended diet for their families.

As mentioned previously, the determinants of dietary habits are diverse and range from those associated with the physical (external) environment within which the family resides to their psychosocial environment, where social surroundings and socioeconomic factors affect decision-making. In order to examine the extensive literature and the complexity of this subject area in a methodological way, the ecological model (Mobley et al., 2009) will be used as a framework for this narrative literature review. Figure 2.2 shows the elements of the ecological model (Mobley et al., 2009) and divides them into:

- Global environment: including such factors as globalisation of food production, food security etc.
- Social environment: including neighbourhood, culture etc.
- Individual (personal) environment: including factors such as knowledge, attitudes, confidence etc.

For this part of the narrative review, the global and social environments will be conceptualised as physical or external environmental factors that influence dietary behaviours and choices. Personal (individual) factors will be conceptualised as the psychological and cognitive factors that influence peoples' dietary behaviour and affect food choices. Therefore, this part of the literature review will be divided into three sections starting with an overview of the literature associated with [1] 'the global environment', [2] 'the social environment' and [3] 'individual (personal) environment'.

Figure 2.2 The ecological model



(Mobley et al., 2009)

2.3.1 Global environment as determinant of dietary habits

People's food consumption is influenced by many global environmental factors. Policies from World Health Organization (WHO), The World Bank, The International Monetary Fund and The European Union have influenced food production, manufacturing and consumption (McIntyre et al., 2010). Agricultural policies, such as subsidies for farmers to grow crops, such as wheat or corn to be used for biofuels, have a significant impact on food security, the structure of food production, processing and marketing systems. These ultimately impact on the variety and availability of foods on the high street (WHO, 2003). The means through which food is transported around the world, and how it is sold, also has an important role to play in improving food security. Therefore, the global food environment, as well as the impact of food policies, affects availability, affordability and access to healthier foods.

Food production

In the last few decades, globalisation of agriculture and food supply has affected the quantity, type, cost and desirability of foods available for general consumption. The promotion of the global marketplace has resulted in all nations, including those with emerging economies, to specialise in producing foods consistent with the desire of the market rather than the health needs of their population. The global marketplace therefore provides the setting for trade of food between countries (McIntyre et al., 2010). As a result, wider and geographically diverse populations have access to international food options. The Foreign Direct Investment Policy allows an international company in one country to directly invest into production or business in other countries. It has made it possible to optimise the effectiveness of marketing and advertising to increase sales in one commodity, and consequently lower prices (Stuckler et al., 2012). The result has been a shift to increasing amounts of dietary fats and NMEs and the convergence towards ever increasing consumption of processed foods. These micronutrient poor foods appear to be targeted at people from lower social economic groups (Darmon and Drewnowski, 2008)

Due to the shifts in food production and manufacturing, the converging trends of the global marketplace means that while the more affluent and educated consume

more expensive and healthier options, the lower income groups buy cheaper and less healthy products. This has been observed with people replacing traditional micronutrient-rich foods with micronutrient-poor food, such as cheap vegetable oils, trans-fats sugar-containing beverages and energy-dense snacks and foods high in fat, salt and sugar (Broadley et al., 2006).

Thus the global nature of food production, marketing and supply has had a profound impact on people's food choices and consumption throughout the world. In particular, this has made less healthy food more available, affordable, and accessible to the population within the lower income groups.

Food security and cost

Technological advances and improvements in logistics, especially in refrigeration and transport, have made it possible for food products from any part of the world to reach any other (Courtney, 2006). As a result, food markets are increasingly reliant on food supplies from different parts of the world. As societies become increasingly interdependent on commodities, natural disasters and other extraordinary events can impact on food security around the world. Consequently, any reduction in agricultural production and availability due to adversity, such as bad weather and unstable political and economic situations can impact on food prices and availability. For example, in 2012 a combination of wet weather in the United Kingdom, drought in the Midwest of America and heat-wave in Russia led to a poor harvest of wheat, corn and soybean. According to the UN's Food and Agricultural Organization, world food prices rose 1.4% in September 2012 and the price of wheat alone rose by 35%. While the overall cost of food is rising globally, unhealthy food products such as corn syrup that are low in nutritional value remain cheap (Sturm, 2005).

In many industrialised societies, unhealthy convenience foods are heavily price-promoted and there are large numbers of special offers on processed foods, sugar-sweetened soft drinks and confectionary in supermarkets, compared with the relatively fewer price promotions on fruits, vegetables and raw foods (Dobson, 2011). In the UK, a National Consumer Council (2008) survey of supermarket offers showed that 54% of in-store promotions advertised sugary and fatty foods (Dobson, 2011). Furthermore,

healthy foods remained premium-priced. As a result, parents who want to provide their children with a healthy diet have to spend more (Ofcom, 2007).

Although some studies suggest that the cost of healthy food options are not always more expensive than their unhealthy counterparts (Jetter and Cassady, 2006; You et al., 2009), many other studies have shown that for families on low incomes, the high cost of healthy food is considered to be a major barrier that many parents face when attempting to provide healthy foods for their children. Eating a healthier diet can be more expensive, with the price of fruit and vegetables reported to be the primary contributors to the extra cost of the family food bill (Gray et al., 2007; Kruger and Gericke, 2003; Yousefian et al., 2011). Studies also show that individuals in lower socioeconomic groups tend to consume foods such as meat products, full cream milk, fats, sugars, preserves, potatoes, and cereals, and relatively low intakes of vegetables, fruits and whole-wheat bread (Darmon and Drewnowski, 2008). Higher-income families have greater intake of polyunsaturated fats, protein, calcium, and iron, and are more likely to meet the recommended number of daily servings of dairy products (Drewnowski and Specter, 2004). This suggests that the family food budget directly influences food selection and diet quality. Therefore, the impact of globalisation on food production can influence the family diet by affecting the availability and cost of food.

Marketing and media

Aggressive marketing of foods and beverages in various media outlets impacts on family food consumption and children's health (Pagnini et al., 2007). Fast foods and high-sugar drinks are among the most heavily marketed products. The target group for these marketing campaigns are mostly children (Cairns et al., 2013; WHO, 2003). Parents' and children's access to various media outlets make children want certain foods that are being advertised and also influence parents' attitudes towards the advertised products (Halford et al., 2004). Studies suggest that food advertising and branding of products can also produce confusion amongst mothers about healthy options. As brands are seen as indicators of quality, they are aimed towards the promotion of foods that can be unhealthy (Dawar and Parker, 1994; Harrison and Marske, 2005)

Advertisements sometimes emphasise health claims (e.g. high in calcium) for foods that have other unhealthy aspects (e.g. high in salt) (Ofcom, (Ofcom, 2007).

Meanwhile, the marketing of “supersized” portions, particularly by fast food outlets, is a common practice in many countries. There is some evidence that people are likely to consume more than the recommended healthy limits if they are given the choice of bigger portions (Fisher et al., 2007; Young and Nestle, 1995). As a result, food marketing and advertising affects parents’ and children’s food choices and eating habits.

2.3.2 Social Environment as determinant of dietary habit

People’s behaviour is influenced by their social and cultural surroundings. The social environment in which people live under will affect their access to resources and materials.

In the context of the family, the social environment will also influence the family’s food environment. Several studies have demonstrated that parents’ dietary behaviours are influenced by the communities and neighbourhoods that they are part of. First, social and cultural values and norms can influence food choices and consumption by dictating what is considered good or bad. Secondly, the physical environment and economic status of the society/community as a whole can impact upon the availability and accessibility to food resources. Finally, parents and children are also thought to be influenced through primary and secondary socialisation, for example via the influence of significant others such as parents, partners, spouses and peer groups.

Social norms

Social environments are driven by social norms. In general, norm refers to expected and acceptable behaviours or actions in different situations (Bicchieri, 2006). Social norm refers to the principles, rules and standards of behaviour and others’ perception about what is acceptable and normal.

In 1956, Morris described norms as “generally accepted, sanctioned prescriptions for or prohibitions against, others’ behaviour, belief, or feeling”. His definition emphasises that norms always include sanctions (Morris, 1956). Norm or social norms have also been defined as the rules or standards based on cultural values that are justified by moral standards and reasoning. Bryant et al. (1985) and Contento

(2007) have suggested that social norms specify the appropriate and inappropriate behaviours for a certain society and that people in that society are expected to conform to those norms (Bryant et al., 1985; Contento, 2007)

Therefore, adaption to the social norm provides the individual with membership of the group. It is the merging of various social norms within society which gives rise to cosmopolitanism; however distinct social norms still exist in relation to culture, ethnicity, neighbourhood etc. It is the performance of behaviours approved by the group that ensures group membership.

As social norm reflects a socially standardised activity (Axelson, 1986) it can also influence many aspects of peoples' lives. It has a pervasive influence on people's behaviour in general and food consumption in particular. Social norms influenced by specific culture can dictate what a healthy diet is, how food is prepared, and also how it is consumed (Bryant et al., 1985; Croker et al., 2009).

Cultural food patterns have primarily evolved from environmental conditions such as climate, technology, geography and food availability (Dickens, 1965). As food serves many functions such as economic, political, recreational, social, religious and medical, it is used for purposes beyond nourishment. People use food to express friendliness and maintain interpersonal relationships, to promote and maintain their social status, to cope with stress and tension, to influence others' behaviours, and for religious and creative expression (Axelson, 1986; Bryant et al., 1985).

Members of social groups and communities share ideas about what is edible and how food should be prepared. Foods that are considered delicacies and desirable in certain societies are regarded as inedible in others. Cultural factors also influence the frequency of food intake, for example the number of times a day one eats varies between different societies. Similarly, different cultures display differences in their dietary quality and nutrient intake. The way in which individuals or groups of individuals in response to social and cultural pressures select, consume, and utilise portions of the available food supply differs across cultures (Axelson, 1986). This is likely to be due to socio-demographic or cultural differences in the types of foods served and methods of preparation. Cultural taboos also have a powerful influence in peoples' food related behaviour (Campbell et al., 2010; Kruger and Gericke, 2003).

The trend of eating out and consuming ready-made meals in many countries has led to a steady increase in the proportion of food consumed that is prepared outside the home (Orlet Fisher et al., 2003; Swinburn et al., 2004; Young and Nestle, 1995). The energy, total fat, saturated fat, cholesterol and sodium content of foods prepared outside the home tends to be significantly higher than that of home prepared foods (Burns et al., 2002). With the availability of snack-sized packed foods that are high in sugar and fat is also leading to reduced consumption of traditional home-cooked foods (Zizza and Xu, 2011). The culture of snacking on readily available foods has also influenced children's eating habits as parents with time constraints opt for convenience.

Neighbourhood

Research indicates that availability of food at the local level varies by the prosperity of the neighbourhood. Poor food retail access in socially deprived areas of British cities is believed to be linked to compromised diets, under nutrition, poor health and widening health inequalities (Wrigley et al., 2003). Areas of high social deprivation with poor access to healthy and affordable foods have become known as food deserts (Beaumont et al, 1995). There is conflicting evidence however on whether food deserts are determinants or consequence of poor dietary consumption of populations in these areas. A Scottish survey found that the amount of healthy food people consumed did not significantly increase after a large supermarket opened in the neighbourhood (Cummins et al., 2005). In contrast, an intervention of retail-provision in a poor-retail-access community showed that there was a significant upward shift in fruit and vegetable consumption in the post-intervention period and was observable amongst those who had the poorest diets in the pre-intervention period (Wrigley et al., 2003). This study showed that people who switched to buying their food in the supermarket from limited-range or budget stores increased their fruit and vegetable consumption by 18%.

Family and socialisation

Peoples' behaviour in their everyday lives is also influenced by others around them. Early influence from home, parents and peers has been defined as primary socialisation. Values and interpretation of behaviour learned from formal reference groups, such as

schools, is known as secondary socialisation (Baric, 1972). With regards to family food consumption, attitudes towards certain foods are influenced by both degrees of socialisation. Children are influenced through primary socialisation and parents, especially mothers, carry out the dietary habits learned in their childhoods. As they grow older, they are not only influenced by the values of their families but also by their social surroundings such as friends and health care professionals (Haerens et al., 2009). Mothers' food choices are also influenced by their mothers or other family members. Infant feeding in many societies is known to be influenced by inputs from family, friends and health care professionals (Haerens et al., 2009). Studies suggest that one of the most common influencing factors identified by mothers is their own mothers (infants' grandmothers) and, to a lesser extent, their mothers-in-law (Kavanagh et al., 2010; Ostbye et al., 2011). As women typically learn about food and cooking from their mothers, or others during childhood and adolescence (Ostbye et al., 2011), and incorporate their mother's food practices into their own food choices maternal influence persists on a family's diet. The influence of mothers, aunts, and grandmothers on a woman's food choices can be significant in extended families living together and even in close-knit families that do not live together (Kumanyika, 2008).

Children can also contribute to the family food environment by influencing their parents' intentions and behaviour. One way parents regulate children's diet is by establishing rules related to food consumption. Children's ability to adhere to these rules is associated with children's healthy and unhealthy food intake (Coesens et al., 2010; Joyce and Zimmer-Gembeck, 2009). Furthermore, both parents and children are likely to influence or be influenced by each other with regards to eating habits, food choices and consumption rules. McCurdy and Gorman (2010) showed that greater child food choice correlated with reduced maternal control of the eating environment. Increased influence of child food choice however also correlated with a less organised eating environment (Campbell et al., 2010; Joyce and Zimmer-Gembeck, 2009; Wardle, 2007).

While children's diet is influenced by many family attributes, such as maternal education, family income and neighbourhood access to various media outlets, the quality of a mother's diet has been reported to be a strong predictor of the quality of diet for young children (Fisk et al., 2011; White et al., 2011). Parents can significantly

impact on the quality of children's diet as role models. Furthermore, mother's presence at children's meal time, parent's expressions for liking or disliking certain kinds of food, maternal control of child eating behaviour, children's food choices, and organisation of the eating environment can also impact children's diet (Lumeng et al., 2008; McCurdy and Gorman, 2010). Activities within the family, such as cooking and eating together, are also believed to positively influence children's eating (Campbell et al., 2007; White et al., 2011).

Other studies have shown that mothers with young children also tend to seek and follow suggestions from health care professionals for feeding infants, which can influence their food choices in their later years as well (Haerens et al., 2009; Swanson and Power, 2005).

2.3.3 Personal Environment as determinant of dietary habits

Although various environmental and social factors influence peoples' behaviour and their intention, peoples' internal or personal variables such as attitude/belief, confidence and nutrition knowledge have also determine parent's behaviour and intentions in relation to providing a healthy or unhealthy diet for their children. These factors can have a significant influence on parents, independent of their external environment and social network (Kruger and Gericke, 2003; Patrick and Nicklas, 2005).

This section of the literature review will highlight the internal or personal factors that influence parents' decisions, and specifically their intention to provide a healthier diet for their children.

Attitude and beliefs

Attitude as a concept, its relationship with other determinant of human behaviour, and its effect on human behaviour has been widely researched. Fishbein and Ajzen (1975) describe attitude as one of the most commonly investigated concepts within psychology (Fishbein and Ajzen, 1975). In that context, attitude is defined as one's favourable or unfavourable evaluation of an object, issue, people or behaviour (Ajzen, 1987). According to the theory of planned behaviour, attitudes are positive or negative evaluations of certain objects, issues, people or behaviours. Attitudes are also

associated with positive beliefs and past experiences (Zanna and Rempel, 1988). Eagly and Chaiken (1993) define attitudes as a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour, and this evaluation takes place as a result of cognitive and behavioural information. Peoples' overall evaluation of behaviour, therefore, is believed to be reflective of their attitude towards that behaviour. Attitude is known to be one of the significant predictors of behavioural intention, which in turn can be an important predictor of behaviour (Andrews et al., 2010).

In relation to the family food environment, maternal attitude towards eating a healthy diet, health motivation and a positive attitude towards the ease of maintaining healthy eating, significantly impacts children's food consumption (Wardle, 1995). Studies show that parental attitudes can affect their children indirectly through the foods purchased and served in the household, which influences the children's exposure to certain foods, their eating habits, and food preferences (Wardle, 1995). Young et al. (2004) found that if mothers thought that healthy eating is important for healthy living, and is easy to sustain, a substantially higher proportion of children of those mothers consumed sufficient fruits and vegetables (Young et al, 2010).

Parents' attitude toward mealtimes and nutrition, their parenting beliefs and practices has also been proven to influence children's health (Contento, 2007; Gable and Lutz, 2000). A study investigating children's consumption of fruits and vegetables revealed that children's fruit consumption is associated with their mother's attitude towards healthy eating and fruit consumption. This study also showed that the mother's food attitude was among the independent factors associated with the consumption of fruits and vegetables by their children (Young et al, 2010). Moreover, parental beliefs about food and their perception about how it affects the human body is also known to influence the food choices they make for their children (Swanson et al., 2011; Wardle, 1995). Therefore, studies show that parental beliefs and attitudes are influenced by society, families and culture and influence the development of their children's attitudes and behaviours.

Confidence and self-efficacy

People's confidence and their judgement on their capability to influence the outcome of certain tasks are believed to influence behaviour. In psychosocial studies, this self-confidence is referred to as self-efficacy (Bandura, 1977). Specifically, in parental feeding behaviour, a positive evaluation of mother's skills, or higher self-efficacy, as well as the expectation of a positive outcome, increases parental motivation for, or intention to prepare family meals. Conversely, those who are less confident tend to be less motivated to prepare a healthy meal and turn to less healthy options (e.g., fast foods) (Beirens et al., 2008; Beshara et al., 2010; Contento, 2007).

Parents' low self-efficacy and child's attraction towards certain foods are believed to influence parents (Campbell et al., 2010; Joyce and Zimmer-Gembeck, 2009; Kahlor et al., 2011). Mothers' perceived time pressure, convenience orientation, and lack of confidence in their ability to prepare healthy meals are thought to significantly impact the quality of family meals (Beshara et al., 2010). Moreover, mothers who were more confident in their ability to prepare a healthy meal served healthier evening meals than those with lower confidence levels (Beshara et al., 2010). Parents' perceived control over family food intake significantly predicted their intentions and behaviour in providing their children with a healthy diet (Andrews et al., 2010; Kahlor et al., 2011; Kruger and Gericke, 2003; Swanson et al., 2011). Therefore it may be concluded that the role of confidence and self-efficacy is central to parental intentions to provide healthy meals for their families.

Nutrition knowledge

Studies show that there is an association between parental nutrition knowledge and children's diet. If a parent has a better understanding of the health benefits of fruits and vegetables, her child will be provided with these foods and be more likely to adhere to recommended intakes (Variyam et al., 1999). In most cases, given that mothers play the key role in determining family diet, their recognition of the health benefits of fruits and vegetables improves the availability and accessibility of these foods at home, leading to higher consumption of fruits and vegetables by their children (Joyce and Zimmer-Gembeck, 2009). Parental concern for children's over-eating due to lack of proper nutrition knowledge can also motivate parents to restrictive feeding practices, however

restriction of intake in turn results in children overeating (Campbell et al., 2010; Joyce and Zimmer-Gembeck, 2009). In many immigrant families, lifestyle changes resulting in lack of perception of healthy food options in a new food environment can also contribute towards the habit of children eating unhealthy meals (Kumanyika, 2008; Vue et al., 2011).

Demographics (education and employment)

In general the level of education, occupational class and income level are the core variables of socioeconomic position. When it comes to parental intention to provide their children with a healthy diet, the socioeconomic status of the family is proven to be one of the most influential factors (McLeod et al., 2011). The association between socioeconomic position and maternal diet is partially mediated by maternal nutrition knowledge. As nutrition knowledge is associated with education, parental education level can impact children's diet. Higher parental education has been associated with better knowledge about nutrition and health consciousness in food choices (Gillespie and Achterberg, 1989). Studies show that mothers' education level was inversely proportional to the amount of sugar intake by their preschool children (Jones et al., 2010). Similarly, it was shown that the use of whole milk was highest in families in which parents had less than a high school education, while the consumption of low-fat milk was highest among children who had college-educated parents (Jones et al., 2010). Studies have shown that appropriate nutrition knowledge of parents correlates with positive nutritional attitude (Gillespie and Achterberg, 1989; Joyce and Zimmer-Gembeck, 2009). Abdel-Ghany and Schrimper (1978) found that the educational level of the female head of household predicted how much money was spent on food. This implies that the higher educational level of the female head of household was proportionate to their awareness about the health and nutritional value of foods, resulting in their propensity to spend more on healthy options.

Mother's employment was also believed to contribute towards the quality of the family diet. While the increased family income associated with mother's employment appears to be an important factor in families' dietary intake and diet quality (Tucker and Sanjur, 1988; Tucker, 1983), mothers' hectic and busy schedule as a result of employment also lead to poorer quality food intake for their children (Gillespie and

Achterberg, 1989; Jabs and Devine, 2006; Moser et al., 2012; White et al., 2011). A study analysing mothers' work schedules and their children's food provision indicates that part-time employed women with higher education deliberately choose a part-time job to be able to provide their children with healthy, freshly cooked warm meals (Moser et al., 2012). Full-time working mothers with higher education, often working in successful positions organised for their children to have meals in institutional facilities e.g. school breakfast clubs (Moser et al., 2012). While mothers employed part-time were more likely to provide healthier home-cooked meals for their children (Moser et al., 2012). Single parent families for both parents working outside the home, and having longer working hours, tended to rely more on convenience foods, low in nutritional values (Jabs and Devine, 2006).

2.3.4 Conclusion

It may be suggested that factors out-with the family such as global food policies as well as social factors, including family demography affect family–food choice. The literature further suggested that of particular importance, regarding the provision of a healthy diet for children was the role of parental choice, their attitudes and self-efficacy or confidence. However, there are gaps in the literature. This review did find studies that highlighted the role of parental behavioural intention with regard to the provision of a healthy diet for children. This illustrates that the current literature would appear to lack evidence on parental behavioural intention and the associated behaviour to provide healthier diets for children.

2.4 Behavioural theories

As previously outlined the family food environment and parental behavioural intentions in providing their children with a healthy diet are influenced by many factors. The complexity of these factors makes the study and analysis of parental behavioural intentions challenging. A suitable behavioural theory is necessary to provide a framework for understanding the impact of multiple factors that influence parental intentions to provide their children with a healthy diet.

Many theories have been developed and used in numerous studies related to parental behaviour and intentions that influence their children. These theories are helpful and effective, as they can assist in the design and framework for behaviour change interventions and also provide a structural explanation of complex behaviours (Armitage and Conner, 2000). As there are many theories developed and used for similar studies, it is hard to identify a single theory that will be most suitable for a particular study. This part of the literature review will provide an overview of key theories and will identify the one that would be most suitable for the forthcoming study.

Literature Search

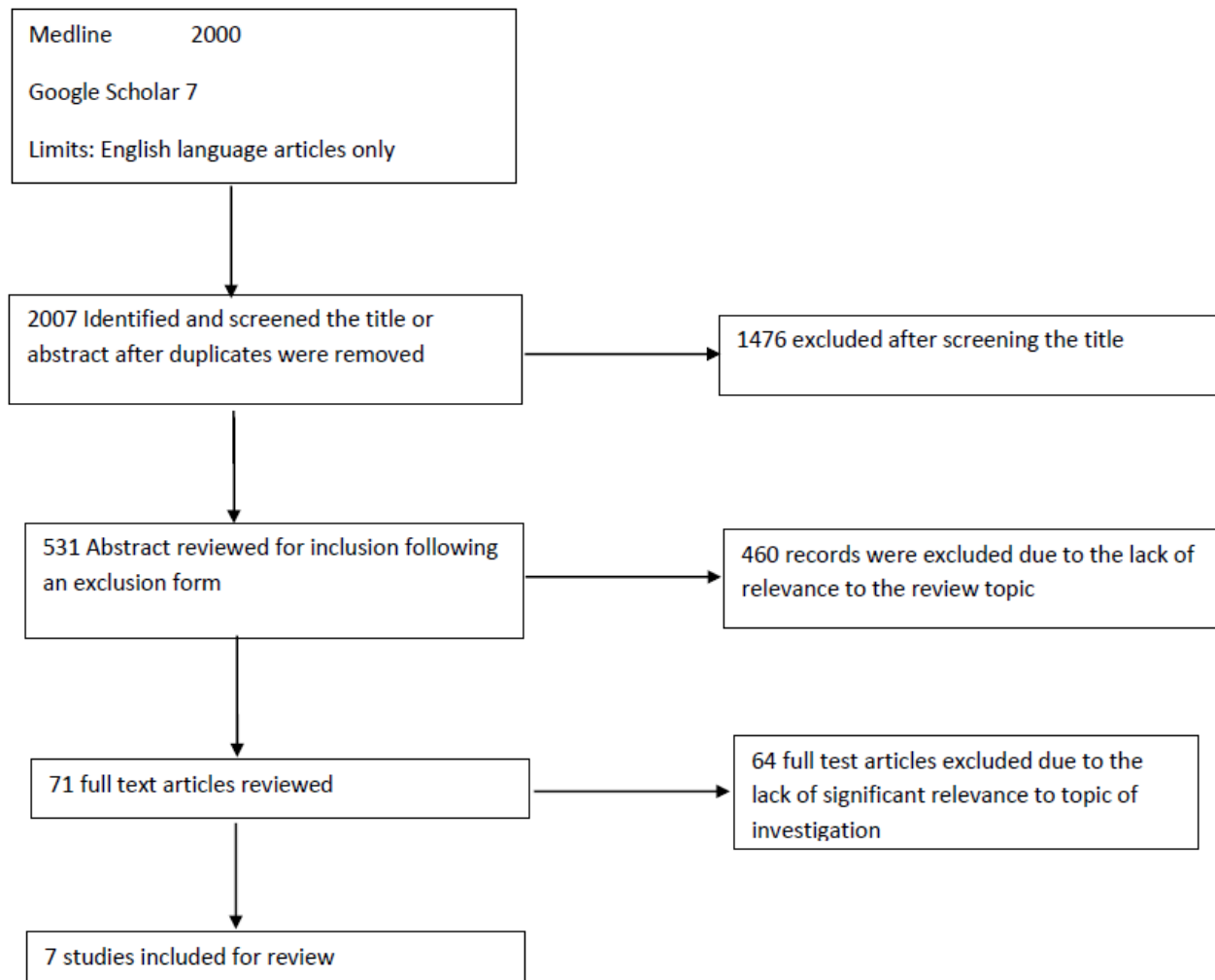
A search was performed on MEDLINE from 2000 to October 2011 (as October 20011 was the time literature search was carried out). Additional searches were performed in Google and Google Scholar and the reference list of the relevant papers were hand-searched for additional literature. Citations were also identified from included papers. Table 2.1 shows the overview of the keywords used for the search. Behavioural and psychological theory based studies that were related to parental intentions and behaviours that impact their young children were included for review.

Table 2. 1 Literature search term

1. determinants.mp.
2. psychosocial.mp.
3. family/ or social environment/ or socioeconomic factors/
4. 1 or 2 or 3
5. *attitude/ or *behavior/ or *child rearing/ or emotions/ or *intention/ or *psychology, social/
6. 4 and 5
7. limit 6 to (english language and humans and yr="2000 -Current")

All the identified articles in English language and relevant to parental behaviour in relation to their children and/or were relevant to behavioural theories were included for the review. Seven studies used behavioural theories or models. The theories that were used in the studies were: Theory of planned behaviour (n=4), Protection motivation theory (n=1), Health belief model (n=1) and Social cognitive theory (n=1).

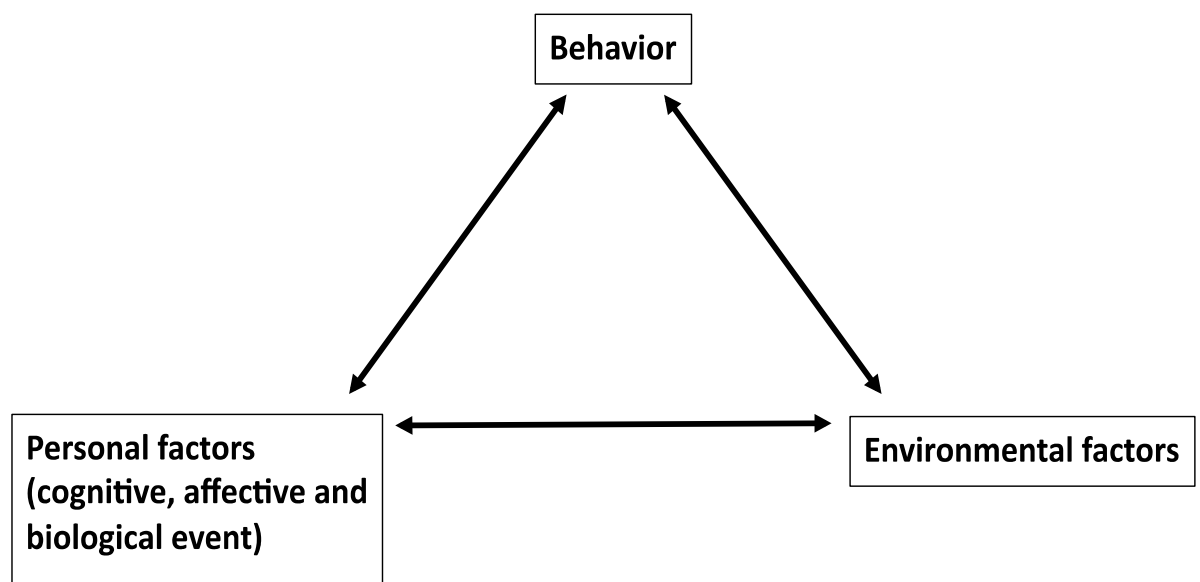
The next section presents an overview of the four behavioural theories; Social cognitive theory, Health belief model, Protection motivation theory and Theory of planned behaviour, that have been used in studies related to parental behaviour in relation to their children (Nyberg et al., 2011, Webb et al., 1988, Beirens et al., 2008, Andrews et al., 2010; Kahlor et al., 2011; Swanson and Power, 2005; Swanson et al., 2011). These theories provide guidance for developing new research and help in understanding health behaviour. The theories included in this review were used in the context of parental intentions and behaviours in relation to the matters impacting their young children. Studies were still considered relevant even if they did not focus on children's diet.

Figure 2. 3 Literature review flow diagram - behaviour

2.4.1 Social cognitive theory (SCT)

Social cognitive theory has been applied to many health behaviour studies related to health promotion, prevention, and modification of unhealthy lifestyles for many different risk behaviours (Redding, 2000). This theory is a modified form of social learning theory and includes environmental and social factors (Redding, 2000). SCT explains how a person's behaviour is changed or modified as a result of the interrelationship between behavioural, environmental (social or physical) and personal factors.

Figure 2. 4 Social cognitive theory



(Pajares, 2002)

SCT emphasises that behavioural, environmental and personal components function as reciprocal determinants for each other and changes in one factor impacts the other. SCT involves numerous key concepts, which have been associated with each of the three main constructs (Bandura, 1989). Self-efficacy is one of the central concepts of SCT. Self-efficacy is defined as an individual's belief or evaluation of their own ability to influence

their behaviour or a situation, and confidence in his/her ability to take an action. (Bandura, 2001).

Although the knowledge of risks and benefits is an essential factor for behavioural change, internal influences, such as beliefs regarding personal efficacy, expected outcome, a person's perceived facilitators and barriers, are also key determinants of behavioural change. Peoples' self-evaluation of their behaviour, control over the outcome and their emotional status are also recognised to influence their behaviour. Reviews show that SCT is useful in explaining health/disease-related preventive behaviour (Armitage and Conner, 2000).

The search identified one study based on SCT (Nyberg et al., 2011). This study was focused on parental behaviour to promote healthy dietary habits and physical activities of 6-year-old children. This clustered-randomized control included 14 pre-school classes (7 intervention groups and 7 control groups) consisting of 242 children in total. This study investigated parental factors such as knowledge, attitude, preference, care and control, role modelling, willingness to change and self-efficacy as a determinant of dietary and physical activity habits and weight development in their children.

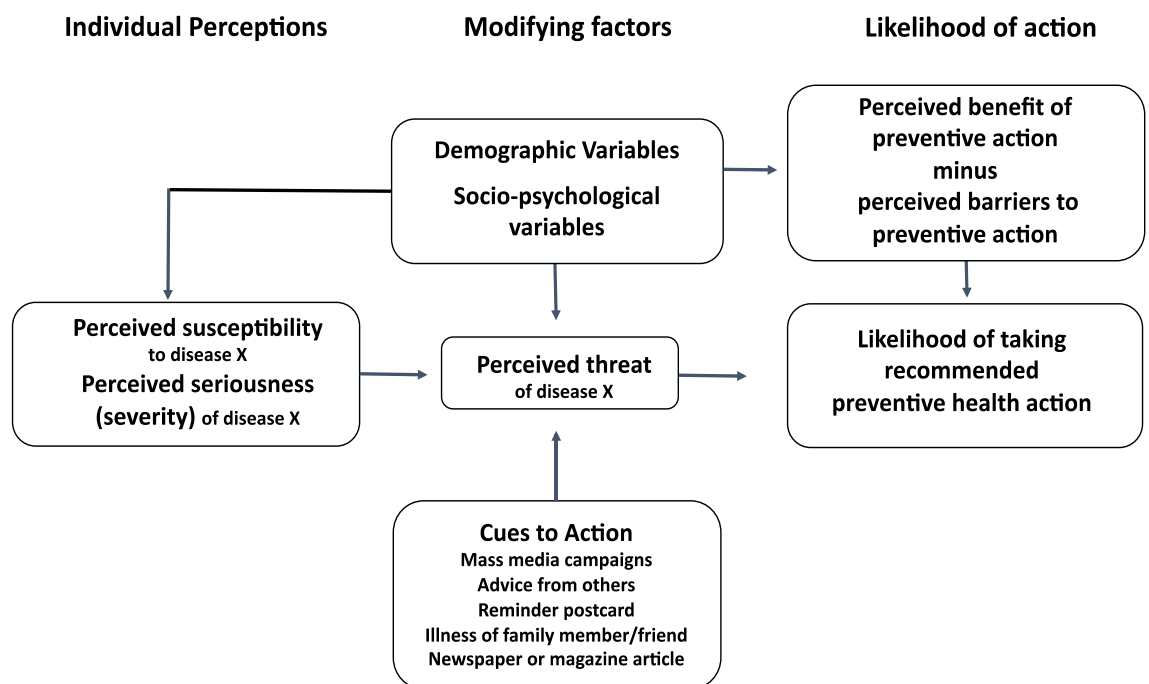
Despite SCT being used to examine parental behaviours, it has been suggested that the theory does not address emotional and cultural factors that play a vital role in people's day-to-day behaviour, such as food choices. A review of behavioural theories however questions SCT's applicability to intervention development because of its broad focus that can cause difficulty in operation (Munro et al., 2007).

2.4.2 Health belief model (HBM)

The health belief model asserts that human behaviour is the result of people's rational evaluation of susceptibility to and severity of certain problems, benefits of a certain action, and barriers to undertake that action to prevent problems (Armitage and Conner, 2000; Webb et al., 1988). According to the HBM, four key components of the model, namely perceived susceptibility, severity, effectiveness, and cost, are determinants of one's behaviour (Redding et al., 2000). These variables can be influenced and are reinforced by cues of action, which is defined as the event or strategy that increases one's motivation and self-efficacy. At the same time, perceived benefits and perceived

barriers can influence people's perceptions of the effectiveness of their behaviour (Rosenstock and 1974). HBM also acknowledges that demographic and socio-psychological variables influence perceived susceptibility and severity as well as perceived benefits and barriers to action. Perceived threat is influenced by cues to action, which can be internal or external (Rosenstock et al., 1988). Thus high-perceived threat, low barriers and high-perceived benefits to action increase the likelihood of engaging in the recommended behaviour.

Figure 2. 5 Health belief model



(Ashford and Blinkhorn, 1999)

The HBM was used in a study which focused on the use of car safety restraints by parents for their pre-school children (Webb et al., 1988). Although the study was not related to

children's diet and eating behaviour, it provides a valuable insight into predicting parental intentions and behaviour in relation to their children. Webb et al., (1988) found that behavioural and social variables, such as socioeconomic status, being married, being a non-smoker, using a seat belt and undertaking other preventive health behaviours on the children's behalf, correlated with use of car restraints. At the same time, the attitudinal, belief and knowledge factors, as well as cost and health locus control factors, were related to their behaviour. Parents, who were likely to state that they could afford the restraints, and believed that they could prevent car injuries for their children, were more likely to use the child car restraints. The study also found that several attitudinal variables derived from the HBM were unrelated to children's restraint use. Parents of restrained and unrestrained children did not differ significantly in terms of perceptions of their children's susceptibility to involvement in traffic accidents, the likely severity of injury to their children in the event of an accident or the importance of using safety restraints or the efficacy of restraints (Webb et al., 1988). Webb et al., (1988) stated that the HBM could not be applied without some modification to measure the relationship between parental health beliefs and parental use of car restraints for their children.

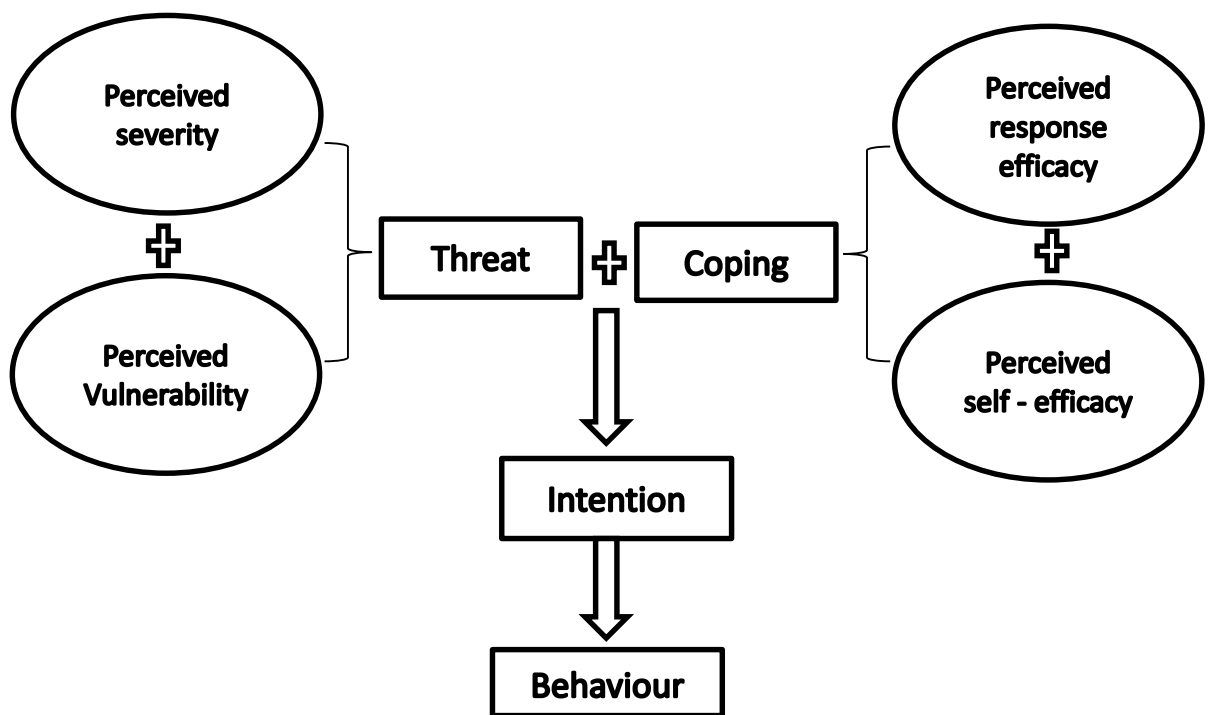
The HBM has therefore criticized as being unable to predict behaviours since it only explores 8% of attitude. Consequently there have been revisions of the HBM, which have been incorporated into the theory of reasoned action to improve prediction.

2.4.3 Protection motivation theory (PMT)

The protection motivation theory (Rogers, 1983) is frequently used in studies related to health behaviour (Beirens et al., 2008; Munro et al., 2007). According to the PMT, behaviour change can be achieved by appealing to an individual's fears. This theory is based on two key concepts, threat and coping. The threat appraisal examines people's perception vulnerability to disease, their belief about the severity of that threat and their evaluation of the rewards gained from taking an action or intervention to tackle the threat (Rippetoe and Rogers, 1987). The coping appraisal examines people's perception of their ability to take preventive action and their evaluation of how the effectiveness of those actions can prevent the threat (termed as response efficacy). PMT

explains that the combination of people's perception of the magnitude of harm, the probability of it happening to them and the effectiveness of the preventive action they take, will determine people's levels of protection motivation and their actions in order to protect themselves from an anticipated danger (Rippetoe and Rogers, 1987; Rogers, 1975).

Figure 2. 6 Protection motivation theory



(Lee et al. 2007)

Reviews of behavioural theories emphasise that the influence of social, psychological and environmental factors on motivation also need to be considered while using this approach (Munro et al., 2007; Rogers, 1975)

This literature search did not find any PMT studies that focused on children's diet and eating behaviours. However, a cross sectional survey conducted on parental safety behaviours in relation to stair-gate use was relevant (Beirens et al., 2008). This study surveyed 2,470 parents with toddlers. The study analysed the relationship between the use or presence of a stair-gate and parents psychological factors based on PMT. The

study found that different factors influenced the proper use or presence of the stair-gate. Parents' perceived advantage and ability to make the proper use of the gate to prevent accidents was significantly associated with the proper use of the stair-gate. However other factors such as their perceived advantage and disadvantage of safe behaviour, other social support and social demographics were also associated with them having a stair gate in the house. This is consistent with the recommendation that social and environmental factors, not explained by PMT, should be incorporated as additional dimensions when using this model to predict behaviour.

2.4.4 Theory of Planned Behaviour (TPB)

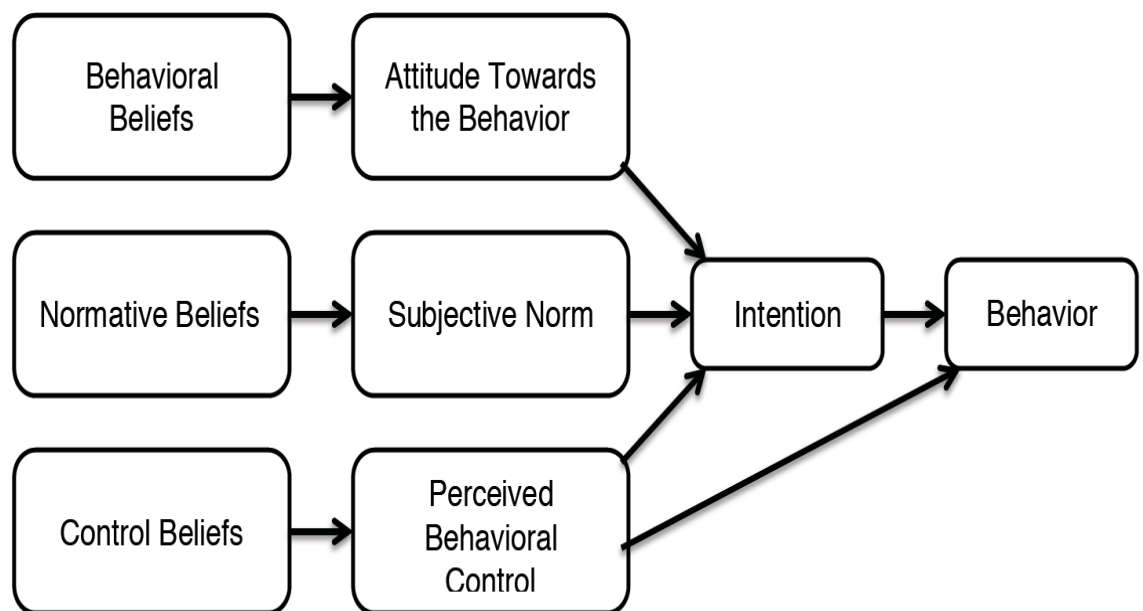
The theory of planned behaviour and the theory of reasoned action are applied to many diverse health behaviour related studies to predict behavioural intentions and account for notable variance in the performance of health behaviours (Andrews et al., 2010; Kahlor et al., 2011; Swanson et al., 2011).

The theory of reasoned action functions under the assumption that humans make decisions rationally and their behaviour is always under conscious control (Mullen et al., 1987). This theory also states that the intention to perform a particular behaviour is strongly related to the actual performance of that behaviour. According to the theory of reasoned action, people behave in a certain way because they choose to do so and use a rational decision-making process in choosing and planning our actions (Fishbein and Ajzen, 1975).

The theory of planned behaviour extends the theory of reasoned action by including perceived behavioural control. The TPB provides a social-psychological framework to understand and predict the determinants of human behaviour and incorporates some of the central concepts in the social and behaviour sciences (Armitage and Conner, 2000). The TPB outlines the determinants of behavioural intentions, which contribute to the actual performance of the behaviour. According to the TPB, attitudes toward the behaviour, subjective norms, and perceived control beliefs usually predict behavioural intentions (see figure 1.7). The combination of intentions and perceived behavioural controls can predict human behaviour (Ajzen, 1991). According to Ajzen, behavioural belief relates to the perceived outcomes of the target

behaviour and their evaluations, and it can produce favourable or unfavourable attitudes towards the behaviour. Normative belief relates to one's perceptions of others' expectations regarding the behaviour and one's motivation to respond to those expectations. This results in perceived social pressure or subjective norms. Control belief refers to perceptions regarding factors that work against or facilitate the behaviour and the perceived ease or difficulty of performing the behaviour. This gives rise to perceived behavioural control (Ajzen, 2002). Each of these variables can influence the others, while also contributing individually to behavioural intention.

Figure 2. 7 Theory of planned behaviour



(Adapted from Ajzen, 2006)

The search identified four studies that employed the Theory of Planned Behaviour on parental intentions and behaviour in relation to their children's diet and eating habits (Andrews et al., 2010; Kahlor et al., 2011; Swanson and Power, 2005; Swanson et al., 2011). Kahlor et al; (2011) investigated parental perceived challenges with regards to giving their children healthy diet using focus groups and found that prompts or phrases related to normative beliefs were mentioned in 78% of the parents' responses and prompts related to control belief were mentioned in 72% of the parents' responses (Kahlor et al., 2011). These two beliefs usually surfaced together and occurred

more frequently than attitudinal belief. The study found that while internal control beliefs were present in many different contexts, limited time and money were the most salient perception of external control. The study concluded that although the TPB factors could be examined independently, the interplay between these factors provides more insight into the theory.

Another study on the prevention of childhood obesity found that the TPB demonstrates its predictive utility in obesity prevention with attitude, social norms and behavioural control predicting behavioural intention (Andrews et al., 2010). Response efficacy was also found to be a significant predictor of parent's behaviour. Swanson and Power (2005) also found that subjective norm significantly influenced new mothers in relation to breast or bottle feeding.

A recent study on maternal feeding behaviour and quality of diet for their 2 year-old children found that socio-cognitive factors such as intentions and perceived behavioural control significantly predicted mothers' behaviour (Swanson et al., 2011). The percentage of variance was 57% for providing breakfast, 65% for cooking from scratch and 64% for providing a sit-down meal.

2.5 Conclusion

Findings from the literature review suggest that while the family food environment can be influenced by various global and social factors, family diet is also significantly influenced by parental belief and attitude towards healthy diet, and their confidence and control in providing healthy diet to their family.

The following investigations in this thesis will focus on parental behavioural and psychological factors with regards to providing healthy diet for their children.

The review of behavioural theories show that there are many theories that can provide framework for behavioural studies and can explain and predict behaviour. Although these theories are not fundamentally different from each other, some variables within their constructs make them more or less suitable for specific research. As this thesis is focused on parental intention, the theory of planned behaviour will be used as a framework where predictors of intention can be thoroughly tested.

Section 3

Purpose of the thesis: aims and objectives

Section 3: Purpose of the thesis

3.1 Introduction

The purpose of this thesis is to investigate factors that influence parents' behaviours and intentions to provide their children with a healthier diet.

The literature review was in two parts. The first part indicated that the influence on household food and consequently children's diet is influenced by various factors: (i) Global environment influencing global food production, food security, cost of food and marketing and media. (ii) Social environment affecting household diet via social norms, cultural norms, prosperity of the neighbourhood, extended family and the process of socialisation. (iii) Personal environment affecting household and children's diet through parents' attitudes and beliefs towards food, their confidence in providing certain together with parental nutrition knowledge and socioeconomic position.

The second review examined behavioural and psychological theories. This indicated the usefulness of these theories when exploring parental behaviours and intentions with regards to children. The theory of planned behaviour, in particular, has been used to investigate parental behaviours and intentions and has been shown to predict intention through attitudes, subjective norm, moral norm and perceived behavioural control.

3.2 Research Question

The research question is: "What factors influence parents' intentions to provide their children with healthier diets?"

3.3 Aim

The aim of this thesis therefore is to investigate the factors that influence parents' intention to provide their children with healthier diets.

3.4 Objectives

- I. To explore qualitatively the social and psychological factors that influence parents' intentions to provide their children with healthier diets.
- II. To examine parental behavioural intentions to provide their children with healthier diets within the framework of the theory of planned behaviour.

Section 4

A qualitative exploration of the influence on family food choice and behaviours: The family food environment

Section 4: A qualitative exploration of the influence on family food choice and behaviours: The family food environment

4.1 Introduction

The literature demonstrated that parents' social and personal environment influences food content and dietary habits of the family. The elements of these environments such as parents' socioeconomic status, their beliefs, attitudes and dietary confidence as well their nutrition knowledge contributed towards parental dietary behaviours. Therefore, it is important to explore the influence of these factors in parents' food-related behaviour with regards to their children's diet in order to identify the factors influencing parents to provide their children with a healthy diet. This qualitative exploration will investigate these factors and their influence on parents' food related behaviours and household diet. Observational studies on parental-child interaction (Freud A 1950) together with investigations into parental influence on child food choice (Jones et al., 2010; Patrick and Nicklas, 2005; Vereecken et al., 2008) showed clearly that parents played, and play, a significant role in their child's developing the healthy eating habits (Jones et al., 2010; Patrick and Nicklas, 2005; Vereecken et al., 2008). It would seem that to understand the role of parental influence from the earliest of times it would appropriate to study parents' behavioural intentions and in particular those parents with children between the age of 2-5.

4.2 Aim

The aim of this qualitative investigation is to explore the social and psychological factors that influence parents' intention to provide their children with a healthy diet.

4.3 Theoretical background: Qualitative Research/ Interview methods

Qualitative research is recognized as a valuable tool to explore in-depth information (Denzin and Lincoln, 2000; Lockey and Hardern, 2001; Symon and Cassel, 1998). In its raw form qualitative data can provide a descriptive record of the research and this can then be analysed in a number of ways. Focus groups and in-depth interviews are used

in the majority of qualitative research for data collection. Both interviewing techniques have advantages and disadvantages. Focus groups are time and labour efficient and good for discussions (Morgan and Krueger, 1993). However, they are harder to organise because gathering respondents in one place at the same time can be difficult. One-to-one interviews are easier to organise and provide privacy for the respondents. Consequently, one-to-one interviews are good for in-depth conversations, as respondents can freely express their opinions and feelings. However this technique can be more labour intensive and time consuming (Wimmer and Dominick, 1997).

4.4 Method

Sample

A purposive sample of parents was selected from participants residing in areas of high and low socio-economic deprivation in Tayside. The Scottish Index of Multiple Deprivation (SIMD 2012) was used to identify areas of high and low social deprivation. Postcodes were used to determine the nursery and community centres to be included in the study. Participants' children attended nursery schools or community centres with mother and toddler groups in Ardler, Law and Dryburgh (areas of high social deprivation) and Broughty Ferry and Barnhill (areas of low social deprivation).

Recruitment

Nurseries and mothers and toddlers groups from different parts of Dundee were approached for permission to contact parents or guardians regarding the study. Meetings with parents were coordinated via nursery and community centre staff. Participants were approached at the nursery schools and mother and toddlers groups. Parents with at least one child between the ages of 2-5 were invited to take part in the study.

Interview methods

Both focus group and one-to-one interviews were employed for the current study. It was decided to use both methods to allow as many parents as possible to participate. Interviews were semi-structured and were audio recorded.

Interview schedule

The literature on areas of parental behaviour with regards to family diet, specifically relating to the diet for their young children, was used to inform the interview items. The information obtained was used to design the topics and questions for discussion. Some questions based on theory of planned behaviour constructs were also included to address psychological variables such as attitude, perceived behavioural control and subjective norms.

Participants were invited to speak about anything in relation to food, the household, family and children's diet. They were asked particularly to focus on their child between the ages of 2-5 while answering the questions. Participants were asked about their own dietary habits, food choices for family, influence on diet, barriers and enablers for providing healthy diet for their children and their opinion on the current food environment. They were also asked about their health consciousness in general, nutrition knowledge and their own dietary experiences as a child.

Table 4. 1 Questionnaire schedule for in-depth interviews

As you might have found out from the information sheet I am going to talk to you about children's diet and the food environment in your family. For the sake of this study we will be mostly focusing on your child between the ages of 2-5.

- First can I please ask you to tell me about yourself and little bit about your family?

(Information obtained from this question or follow to this question were name, age, marital status, employment status, number of children and their age)

- Does (child name) go to nursery or stays with you or someone during the daytime?
- Who prepares meals in your household?
- How is he/she in terms of his eating? How would you describe his/her daily diet?
- Is that similar to what you had as a child?
- What are mealtimes like in your family?
- Who chooses the food items for the family or children?
- What do you think is a healthy diet for a child or a family?
- Why do you think the children should eat these foods?
- How easy is it to provide this diet for your children?
- What do you think makes it difficult for you to give this kind of diet to your children?
- Is there anything that makes it easier?
- Does your child get to eat these foods?
- Do you seek any suggestions from your extended family or friends about foods for your child?

Follow up questions to find out about food backgrounds and their influence

- Do you think the diet you are giving your child healthy enough?
- If not why?

Follow up questions to obtain the participants views about barriers

- Do you feel you have control over the family food environment?
- Does (child's name) eat what you give him/her to eat?
- How about the things you don't want him/her to eat?
- Is there anything that I might have missed, but you think might be important for this study?

Interview procedure

All the interviews and focus groups were conducted in nursery schools or community centres. For all one-to-one interviews, children were not present in the rooms where interviews were conducted. During the focus group interviews, children were in the

same room but were supervised by someone other than the participants. All the interviews and the focus group were conducted in person by the same researcher.

Participants were made aware of the subject area of the interview through the information sheet provided. Questions to be asked during the interview were not discussed before. The one-to-one interviews ranged from 30-55 minutes while the focus group discussion lasted 50 minutes. All the interviews were conducted between April and June 2012.

The focus group and the individual interviews were semi-structured. However most of the questions were open-ended and participants were encouraged to discuss other topics that were important to them.

Ethical considerations

Ethical approval for this study was obtained from University of Dundee Ethics Committee (UREC 11138). Participants were provided with an information sheet explaining the method and aim of the study (Appendix 1). ST was on hand to provide further information if needed and answer any questions. Parents interested in taking part in the study were requested to sign a consent form before the interview.

Data management

All the interviews were audio recorded. ST transcribed recordings at a later date and notes made during the interviews were referred to if any part of the recording was unclear by way of clarification.

Data analysis strategy

The data was analysed using the framework analysis approach (Ritchie and Spencer, 1994). As qualitative data is usually high in content volume and not organized in its raw form, researchers often employ processes to systematically manage and interpret data.

The framework analysis approach was used to manage systematically the data in different interconnected stages. The framework analysis approach was developed in the 1980s and has been used for analysing qualitative data in many areas, but primarily in health care settings (Ritchie and Lewis, 2003; Smith and Firth, 2011; Srivastava and

Thomson, 2009). Similar to thematic content analysis, it guides the process for the data to be coded, interpreted and developed into refined themes that can ultimately describe and interpret participants' views and answer or address research questions in a methodical way (Pope et al., 2000; Ritchie and Lewis, 2003). Unlike many other analysis methods, this method is comprehensive and transparent as the full original textual material is reviewed and can be easily retrieved and viewed by other people. This approach enhances the reliability of the study as it makes it easy to track the subjectivity of the researcher more easily and allows the reader to clearly see how conclusions are drawn (Braun and Clarke, 2006). It is specifically suited for analyzing cross-sectional descriptive data because various themes can be captured and analysed under a limited number of concepts (Ritchie and Lewis, 2003). At the same time it gives flexibility to the researcher as the analysis can be started before collecting complete data.

There are 5 stages for data analysis in a framework approach (figure 4.1);

1. The first stage is familiarisation, where the researcher becomes familiar with the data by listening to the audiotapes or reading the transcripts. This makes the researcher aware of recurrent themes or ideas for overall data.
2. Identifying a thematic framework is the second stage where the key themes and issues can be used to filter the data.
3. The third stage is indexing, where sections of the data can be linked or associated to a particular theme.
4. The fourth stage is charting, where individually indexed data can be arranged in a chart of the themes together. At this stage the text is transferred from the original context (transcript/audiotapes) and organized in a chart with headings and subheadings.
5. The final stage of the approach is mapping and interpretation where the researcher can explain associations and provide explanation based on the analysis of the characteristics presented on the chart (Ritchie and Spencer, 1994).

Table 4.2 presents an example of how the data is processed from transcript to a core theme using the data collected for this study.

Figure 4. 1 Stages of framework approach



(Ritchie and Spencer, 1994)

Table 4. 2 Transcript coding - framework approach

Coding index			Initial themes & categories		Final themes and core concept		
Transcript	Description	Preliminary thoughts	Initial categories	Initial theme	Refined categories	Final themes	Core concept
Deborah: Some cheap things you know are really not healthy but if you are on the tight budget you know you say well it easier to go for that option its cheaper and its quicker.	Cheap food not healthy	Parents seem to compromise on healthy diet because of the cost	Cost of healthy food	Economic and Social factors	Economics	Cost of food	External influence
Linda: when I was a stay at home mum- every meal was home cooked and now its more ready meal but I still consider the home cooked meal to be more healthy.	Job and preparing meal Home cooked meal	Not working parent cooked more often	Home cooked meal Mother's time	Parents' Employment as barriers to healthy diet	Time and convenience	Work and life balance	External influence
Stephanie: There are a few other things but generally it's prepared from baby and toddler recipe book. I go through those and pick things that are healthy for the whole family.	Using recipe book to prepare meal	Parents made use of media resources	Using external resources	Positive influence of media resources on parents' nutrition knowledge and cooking	Parents' nutrition knowledge/ cooking practices	Influence of Media	External Influence

4.5 Results

Sample

Fifteen parents participated in the study. Eleven participated in the in-depth interviews; of which eight were mothers, two were fathers and one was grandmother. One focus group consisted of four mothers. Table 4.3 and 4.4 show participants' demographic details. Participants' names have been changed to protect their privacy.

Table 4. 3 Sample profile

Demography	Categories	Number participants
Gender	Female	13
	Male	2
Age	16-34	6
	35 or over	9
SES	Child in nursery in areas of low deprivation	7
	Child in nursery in areas of high deprivation	8
Ethnicity	White	10
	Others	5
Children	One child	6
	More than one child	9
Employment	Working full-time/part-time	4
	Not working	11

Table 4. 4 Participants' demographic profile

Name	Gender	Age	SIMD	Ethnicity	NoC
Lindsay	Female	Older	H	White	4
Beth	Female	Older	H	White	1
Nikita	Female	Younger	L	Asian	2
Bandana	Female	Younger	H	Asian	1
Panna	Female	Older	L	African	3
Stephanie	Female	Younger	L	White	2
Morag	Female	Older	L	White	4
Deborah	Female	Older	L	White	1
Linda	Female	Older	L	White	3
Ian	Male	Older	L	White	3
Rebecca	Female	Younger	H	Asian	2
Wendy	Female	Younger	H	White	1
Anne	Female	Older	H	White	4
Samantha	Female	Younger	H	White	1
Vivek	Male	Older	H	Asian	1

Note: 'NoC' = the Number of children

Family-food environment

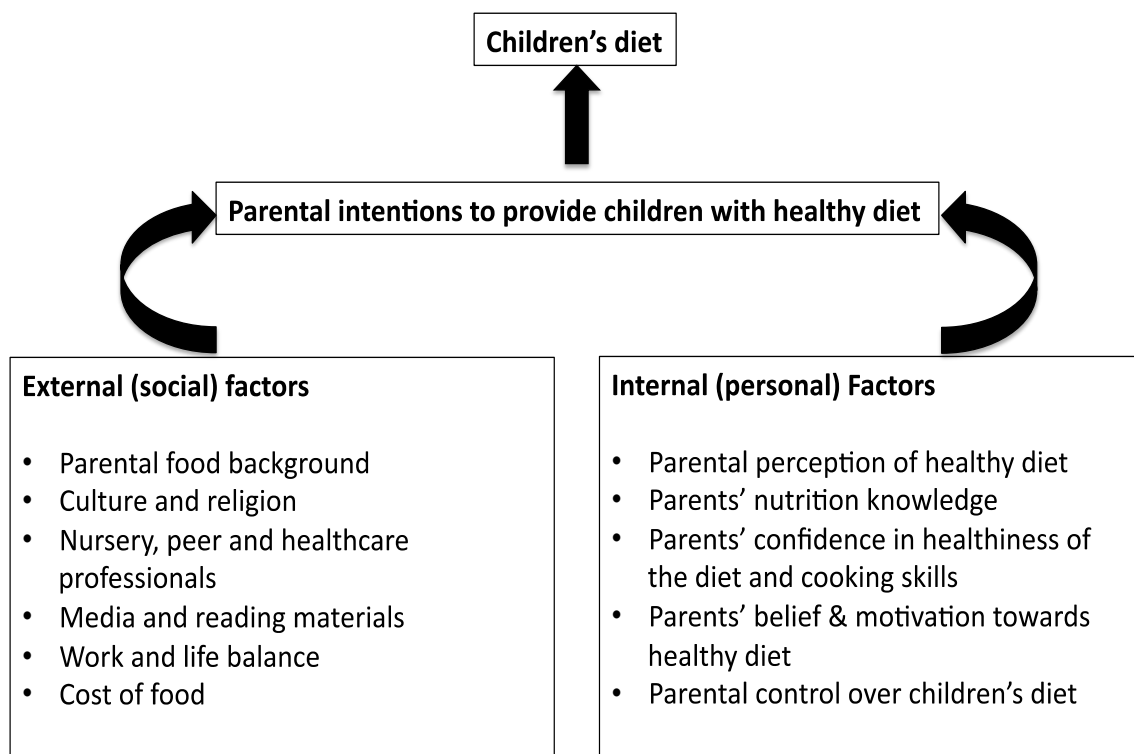
Food-related household environment such as eating habits, food available in the house, eating rules, cooking and dining environments within the family influenced family diet. This collection of factors emerged in terms of household environment and this household environment related to food and dietary habits has been conceptualized as family-food environment for the purpose of this study.

Several further themes emerged from the data surrounding the family-food environment. These were divided into two categories: 1) influence of external (social) factors on parents as enablers or barriers to provide healthy diet to their children; 2) influence of internal (personal) factors such as attitude, motivation and control on parents towards

providing a healthy diet for their children. Therefore the family-food environment reflected determinants from the social and personal environments.

For the purpose of this qualitative exploration, factors such as cost of food, culture, media and social networks, nursery environment and healthcare professionals that influenced the family and children's diet from outside of the household environment, have been categorised as external (social) factors. Parental psychological and cognitive factors such as their beliefs, attitudes, confidence and food awareness that may be unique to each family or parent and, that influence family and children's diet from within the household environment are categorised as internal (personal) factors (Figure 4.2).

Figure 4. 2 Influences on children's diet



4.5.1 Influence of external (social) factors

The family-food environment and the diet that parents provided for their young children were negatively or positively influenced by various external (social) factors such as their own growing-up background, social networks, availability and the cost of food. These so-called external (social) factors influenced participants in their own food consumption and the diet they provided for their children or family. These factors emerged as a continuum from primary (e.g. parental food background) to secondary socialisation (eg role of health professional).

External (social) factor: Parental food background

Parents talked about the kinds of food they ate and the eating environment they were exposed to while growing up. This environment, often influenced by culture, social norm, religious beliefs and nutrition knowledge that one or both parents grew up with, was conceptualised as family food background. Family food background influenced family diet through intergenerational transfer of dietary habits and changing food environments. Many parents mentioned their own growing-up background as one of the major influences on the diet they provided for their family. Consistent with this and when asked what their child's regular meal was like, most parents mentioned that it was similar to meals they were given when they were growing up. Some parents identified the practices of their parents in terms of diet as example. Stephanie, a 26-year-old mother of two, said that the food she made for her boys were the foods she grew up eating.

Stephanie: It's similar. It's certainly the kind of food my mum cooked and I cook for my kids but I don't think we sat down around the table with my parents.

Wendy, a 27-year-old mother of two also made a similar point.

Wendy: Because you always remember it. Yes I think that (own eating experience as a child) has quite a big influence on me. I think it's the habit I picked up and what I heard from my parents. My mum did not work since I was very young so the money was tight so everything was cooked from scratch.

Participants who frequently saw their parents said that their parents still influenced their own diet and the food provided for their family.

Morag: Well, when we go to (my Mum's) it's always on Sunday and we have roast, vegetable and potatoes but. Occasionally she advises us, (but) not in our regular meal.

Deborah: Yeah, I don't prepare every day, I go to my mum sometimes and she prepares food for me. When we visit mum she would always bring doughnuts for the children and things for the children and you can say so much but you don't want to offend your family so and we never had that when we lived abroad.

However, a conflict occurred in some instances, for example, some parents indicated that they felt that their own mothers' practices were not always "right" and they wanted to do "better" for their children. These parents mostly commented on the food content provided by their parents implying that the diet that they had as children lacked variety, nutrients and contained excessive amounts of fat and/or other unhealthy ingredients. Deborah's and Samantha's opinion are illustrative. They thought that the meals they consumed as children were "not good enough" and they consequently were giving a "better" diet to their children.

Samantha: I think I do a wider variety of things that I will cook and don't think my mum did.

Linda: My mum was meat and two veg, traditional mince, sausage and meat and fish finger for kids, I hated it. She was not adventurous with food at all. She never tried anything new.

Ian: My mother was not a cook, I think back in those days they were not open to new taste. Like if my mum made roast potatoes they were deep in fat.

External (social) factor: Culture and Religion

Culture emerged as an important influence on family-food background. This was apparent when comparing the diet between parents born and raised in Scotland and parents who grew up within other culture groups. Many parents from Scottish backgrounds for instance spoke of having Sunday roast dinners with puddings or a sweet to finish. These parents also spoke of other food items such as fish fingers, mince pies. Parents from, for example, Asian backgrounds spoke of having rice, chapatti, lentil soups and home-made curries as part of their regular diet. The division of labour within the home, particularly with regards to the preparation of the family meal, was also different in these groups. Deborah, who was born and grew up in Scotland herself but had lived in Greece, compared the two cultures in terms of the roles of motherhood.

Deborah: In the Greek culture, either mum stays at home and provides for their children, or if they have enough money generally they have people coming into the house who will cook, do all the cooking so nearly all food is prepared from scratch and there's not really access to many processed foods. So you know even juice, you know diluting juice you get here, you don't get that.

Nikita, a 33-year-old mother of two, who was born and grew up in the Indian-subcontinent but now living in Scotland, stated that she provides the same kinds of food she grew up with, for her own children.

I cook Indian food, which is like daal which is lentil, high protein in that and any one of the vegetables. Mostly I try to make it green and they like everything, they even like Indian sweets.

Religion was related to culture. Some parents from ethnic minority groups indicated that their children's diet was also influenced by their religious beliefs. Parents' religious beliefs seem to influence mostly the contents of the foods, such as eating vegetarian or halal meat. Religion did not affect the mealtime routine, feeding strategy or indeed parental attitudes towards a healthy diet.

Panna: First of all because diet wise we are very particular, because we are Muslims we are very particular between haram and halal so they don't always get the as many choices.

Nikita: With my kids, they do like pasta, pizza sometimes, obviously because they don't eat non vegetarian they don't have that much of the options with British food.

External (social) factors: Nursery, peer and healthcare professionals

Parents spoke of the additional influence of their and children's social networks such as school and nursery environment, their peers and healthcare professionals on their own and family dietary habits. Most of the parents said that they had not "formally" sat down with children and talked about the benefits of healthy diet or risks of unhealthy diet but their children had learned about healthy diets in school or even in nursery. Some parents cited eating habits of their friends' or other peoples' children as examples of better or worse eating behaviours but stated that this did not influence their decision to provide a healthy diet for their own children.

Stephanie: My friend gives her daughter chips with salt but I would never do but other friends whose kids drink water and I wish my kids would drink water more.

Anne: I think it does affect their health really, like you see somebody going on about how their child is not behaving well but you see a Coke in their hand and may be in baby bottle and a big sausage role.

Parents mentioned support from healthcare professionals such as a midwife, health visitors, doctors and dentist that parents met at different stages after having their children. These healthcare professionals appeared to influence parents' food related attitudes and knowledge. Some mothers talked about how the advice they got from health visitors soon after their baby was born or during their health visits was useful information and remained important when considering the health of their children. This appeared to reflect the process of formal secondary socialisation.

Anne a 37-year-old mother of two said that she was advised about healthy eating by the health visitor while weaning her daughter *"They [health visitors] talked about five-a-day and she was very good"*. Linda and Panna also had similar experiences.

Linda: We were always encouraged by the health visitor to introduce the proper food.

Panna: Midwife and health visitors they gave some tips, now that I get the Healthy Start leaflets and they tell you a lot about healthy diet as well.

Some participants also mentioned that their doctors or dentists advised them about the health consequences of eating some unhealthy food items.

Ian: I think from the dentist they know sweets are bad.

Parents also spoke influence of nursery or peer directly on children. Most parents thought that children's social surroundings were one of the factors influencing their food preference and their eating habits. Some parents, especially those who had older children, said that their children are mostly influenced from the nursery and their own friends. Parents talked about both positive influences from the nurseries as their children learnt about healthy diets or about eat healthy snacks, however the negative impacts included seeing other children eat the foods that the parents would avoid or limit at home. Lindsay talked about how her children were positively influenced from school and nursery.

Lindsay: They get lots about it in the nursery, they do learn quite a lot at the nursery, school is sending the healthy charts and stuff and five-a-day and all that and the labels with vegetarian.

Linda: In nursery they get basic understanding that veg and fruit is good and sweets are bad. The problems come from them seeing other kids eating whole pack of sweets.

Deborah indicated that not only was her child's preference for food items influenced, but his eating habits were affected from the nursery environment.

External (social) factors: Media, advertising and reading materials

Some participants identified media such as television and magazine as the factors influencing their food choices directly or influencing their children's preferences. Television advertisement for unhealthy food items were seen as a "bad" influence on children. In contrast, some parents identified magazines and recipe books as sources of positive influence regarding choosing a healthy diet. Interestingly, parents mostly talked about the influence of media on them rather than their children. Rebecca, a 24-year-old mother of one thought that seeing food advertisements in media such as television was likely to influence her food choice.

Rebecca: Yeah I think it probably does, because you see things on TV and then think oh that looks good.

Deborah and Morag also talked about the influence of media on their food choice. However, unlike Rebecca, they thought that written media such as magazines and the recipes from cooking shows assisted them to make better food choices for their families.

Deborah: If I see something in a magazine I would think oh that looks nice maybe I might try that.

Morag: There are a few other things but generally it's prepared from baby and toddler recipe book. I go through those and pick things that are healthy for the whole family.

External (social) factors: Work and life balance

Most of the participants talked about how they tried to balance work with family life and do the best they could for their children. Many parents talked about different diet content and food routines depending on whether they were working or not and whether it was a weekday or weekend. Mothers' time-constraints and convenience of buying and using certain food items were factors that influenced their choices. Deborah talked about the time constraints that as a working mother she faced. She felt compelled to make unhealthy food choices when preparing meals because of time constraints, due to her busy work schedule.

Deborah: You see everyone is so busy all the time. Everyone is working, it is difficult to fit all the things that you want to do and there is such a choice of read-made meals. Some of them are healthy and some of them are not healthy. When the children are at the nursery like 1-3 I am free so I might go home and prepare the dinner for that night so that's ok but the days that I am working all day, it has to be something quick, I can't spend an hour in the kitchen.

Deborah's views were shared by other mothers who implied that their employment acted as a time constraint factor in the provision of healthy home-made food.

Linda: when I was a stay at home mum- every meal was home cooked and now it's more ready meal but I still consider the home cooked meal to be healthier.

Samantha: The days I don't work I make from scratch but the day I do work they will have chicken nuggets or things like that.

Stephanie: Even though there is cooking in weekdays it's not cooking from scratch. I cook a proper meal on Sunday. It's a matter of time and exhaustion as well.

Lindsay: If I am in a hurry I will buy a frozen pizza and I know that is not healthy at all, I know kids like it, it's quite like, kids will eat that as a quick fix, but yeah I do consciously think that's not really good but on4 33 2Qce in a while can't be that bad.

External (social) factors: Cost of food

All participants talked about the financial costs of food and identified the cost as one of the influential factors in their decision to buy or prepare meal for their family. Cost of food seemed to be influential in parents' food choice regardless of their cultural background, demographic and employment status. Most of them suggested that healthy food items were more expensive and unhealthy items were more affordable, readily available, and more convenient. Some parents talked about the strategies to get healthier food options regardless of the cost. None of the participants identified the lack of accessibility as reason to not provide a healthy diet for their children.

Vivek, a 35-year-old single father of one, said he was conscious about the consequences of eating an unhealthy diet but at times choose food items that he knew were not good for his son.

Vivek: Some cheap things are really not healthy but if you are on the tight budget you know you say well it easier to go for that option it's cheaper and it's quicker.

Lindsay: Healthier food is more expensive. Those foods [unhealthy options] are a lot cheaper and that's why sometimes I do buy them more.

Some parents also talked about how they planned their food purchases to deal with the higher cost of fresh and healthy food items by buying in budget supermarkets, buying less expensive brands, buying food items on promotional offers, and using up all the ingredients that they had bought.

Morag: I think some of the healthier foods are more expensive but I think you got to be careful about it. I think you can buy the healthy stuff but sort of watch maybe buy a different brand or something.

Anne (FG): I think the budget is the big thing because there are things you wanna buy but are more expensive. On the plus side because it costs more to buy fresh you are more likely to use it rather than it going to waste but I think fresh ingredient needs to be cheaper

Samantha (FG): I do buy a lot of fruits and veg that are frozen just Tesco market value and stuff because it's same ingredient anyway.

Stephanie: I think number one is value for money like if there is something everyone likes but is not in offer we would not get it that month.

It is of interest to note the potential generalisability of this finding, since the above parents were from different demographic and cultural background but all used the same strategies to manage their food budget, food shopping and meal plan in order to get the healthiest possible diet for their family.

4.5.2 Influence of internal (personal) factors

Findings from the interviews and focus group discussions showed that while there are many external influences that affect parents' decision towards their family food environment and children's diet, there were many internal factors such as parental attitude, self-motivation and control that influence parents in this regard (figure 4.2).

Influence of internal (personal) factors: Parents' perception of healthy diet

All the participants interviewed had an idea of what constituted a healthy diet for their children and the impact of diet on their children's health. The participants identified food

items such as fruits, vegetables and fresh food as healthy and sweets, crisps and processed foods as unhealthy. Only a few participants talked about dairy products. When asked what they considered a healthy diet for children, the following remarks are illustrative:

Panna: I have always been thinking vegies are good for health. I go (tell the child) you are going to have fruit because you had that bag of crisp in school and you are thinking about chocolate and you have got to break that down you need to have your fruit.

Panna, a 39-year-old mother of four, seemed aware of the importance of a balanced diet and wanted her children to get enough healthy food even though she could not completely control the unhealthy food items her children ate. Beth, a grandmother and Linda, a 36-year-old mother of three, also had their own ideas of what a healthy diet is.

Beth: To my mind healthy food is just ordinary food, you know like beef, beef mince, chicken, fish and vegetable.

Linda: I do pick up vegetables and other variety of things.

Some participants perceived ready-made meals as unhealthy but very few participants identified specific contents or ingredients, such as salt, sugar, and preservatives, within the prepared meals as unhealthy. They often described the healthiness of foods in very general terms such as fruit as “good”, vegetable as “healthy” or sweet as “bad”.

Lindsay: We try to make it like it's not all processed, you know what I mean it's not all coming out of the box and go straight in the oven. I try to get like fresh ingredients.

Influence of internal (personal) factors: Parents' nutrition knowledge

Parents wanted to know what foods their child ate and to be able to identify the food items their children consumed. They were concerned about ‘what goes on inside’ the pre-packed food items. Deborah, spoke about how things seem healthy from the outside but when you know the ingredients used in the meals these are not always healthy.

Deborah: Yeah you know what goes into it, sometimes you buy something you see and oh that's really healthy and you see what's inside it and it's not healthy at all.

Morag, was happy about the fact that she prepared meals from baby and toddler recipe books and so knew what ingredients were used: “I go through those baby and toddler recipe books and pick things that are healthy for the whole family. [With the food cooked from scratch] You know what is going into and that comforts me”.

Most of the participants seemed to know about the healthiness of the food items they regularly gave their children and mentioned that fruit and vegetables were part of their child's daily meal. Some parents were knowledgeable of the five-a-day recommendation. However, some parents had a misconception or partial knowledge about the healthiness of some of the common food items.

Lindsay, a 36-year-old mother of four, knew that giving fish was good for her children's health. She thought by giving them fish fingers she could fulfil the nutrition need for fish. In this case, while she knew that the fish content in the fish fingers was not as good as fresh fish, she seemed unaware of the potentially unhealthy ingredients and preservatives used to prepare fish fingers.

Lindsay: They will have fish fingers or things, it's not like fresh fish from the fishmongers or anything but I try to make sure its 100% haddock so they will get a bit of the fish.

Another participant, Bandana, mentioned that she would give her daughter "rice or daal and add more ghee on it" implying that ghee would enhance the nutrition value of the food items and seemed unaware of the potential risk of excessive consumption of saturated fat.

Some parents believed that the children's diet would be healthier if they cooked food "from scratch" themselves using fresh ingredients. Lindsay thought she could provide healthier meals if she cooked using her own ingredients but felt she did not know how to cook as she did not have the appropriate cooking skills to do so.

While parents wanted to provide a healthy diet for their children as much as possible, most indicated that it was acceptable to let children have some food items they considered unhealthy on special days or occasions. These 'accepted unhealthy' eating occasions were both occasional as well as part of routinely planned eating arrangements. Once more, culture, family members, peers and children themselves influenced special occasions. Most parents however were comfortable with and in control of breaking their food rules on special family or religious occasions.

Nikita: Sunday because it was Mother's Day we went out and they all got a glass of Diet Coke. I don't have any problem with the fact that they are eating junk occasionally, I am happy as long as they eat two meals properly.

Morag: Treat wise may be McDonalds or something may be every 3 weeks or so.

Deborah: If it's a special occasion or we visit someone's house we do bend the rules.

Therefore the convenience and ready-made foods, parents choose, such as pizza and chicken nuggets were known to be unhealthy but parents seemed comfortable with unhealthy food choices as long as their children were not having them every day and only on special occasions.

Influence of internal (personal) factors: Parents' confidence in healthiness of the diet and cooking skills

As parents had a perception of what constituted a healthy diet, when asked if they thought their children's diet was healthy, most of the parents were happy with its nutritional value. Some parents indicated that they would eat or give their children a more healthy diet if they had better cooking skills.

Deborah: Most of the time, I am quite happy with the diet that they get, and I think it's important for them to have you know fries and a burger or whatever every now and again but just not all the time

Beth: I don't really think about it too much but I am aware that I am trying to give her food that's good for her that's healthy.

Anne FG: she has got her own sort of vegetables, fruits and anything but the two-year-old he is more of a grazer, he does not seem to like big meals. I am sure there are healthier alternatives to what we eat but they get veg and beans but we could do better.

Only a few participants said that their lack of cooking skills might have impacted upon the family diet and their confidence to provide healthy meals. None of the parents identified lack of appropriate nutrition knowledge as a reason for their child not having a healthy diet.

Influence of internal (personal) factors: Parents' beliefs and motivation towards healthy diet

Parents associated their children's diet as a part of their identity as a parent. Parents thought that a healthy diet was essential for their children and identified it as their responsibility and moral obligation.

Parents thought doing extra work to prepare a healthy meal, spending more money or time to prepare healthier options was just part of their responsibility of parenting. Parents identified keeping their children healthy as their first priority and mentioned as the reason

for providing children with healthy foods. Panna said that her children's wellbeing was her responsibility and her priority.

Panna: My first priority is my kids. They should be healthy mentally, physically and that's just my responsibility.

Beth: Well, I think I feel responsible for Annie's eating and I don't think I have gone an extra mile.

Stephanie implied that cooking healthier meals for her children was linked to her identity as a mother.

Stephanie: I feel [by giving the healthy food to children] I would be a better mum and not a lazy mum.

Parents valued their children's eating habits within the overall evaluation of children's behaviour or their identity. When asked how their children were in terms of eating, parents often categorised the children as good, not too bad or difficult.

Deborah: She is good. She likes fruits and vegetables.

Many parents were aware of the health consequences of an unhealthy diet. Lindsay said she was giving her children healthy diet so that they could be healthy and did not "want them to be overweight or have bad teeth".

Some parents said that they talked to their children about the benefits of a healthy diet or why they need to eat certain food items more than others.

Deborah: While he did not have any dairy in his meal so we said to him like you have to have some because we need it for good bones and that made a difference.

Some parents were motivated to give their children a healthy diet and teaching them about healthy eating habits at an early age so that children will eat more healthily later in life. Linda and Ian thought that if they taught their children about eating a healthy diet, they would continue the good habits through adulthood and may pass them on to their children.

Ian: I think if they know what the healthy meal is they will later in life cook and eat healthy.

Ian and Linda appeared to be embracing ideas of primary socialisation with regard to their children's food choices, reflecting intergenerational influences on food choices.

Influence of internal (personal) factors: Parental control over children's diet

Most of the parents talked about ways they controlled what their child ate. Parents mentioned their food choices and feeding strategies that were practised in the household as 'rules'. However some parents, who had more than one child, said that they cook what everybody liked.

Parents had different strategies for controlling unhealthy items. Parents controlled children's diet and the family food environment by setting family rules regarding diet and mealtimes, and by making some foods more accessible than others for their children. Some parents said they limit the presence of some unhealthy items in the house.

Deborah: What normally happens is I buy one or two boxes of ice lollies or we will make a batch sometimes with fruit juice or whatever but she gets obsessed with them, so when they all finish I will wait for a couple of weeks to before I buy another boxes. She loves them so she gets them but you know maybe one week out of five or six.

Stephanie: Yeah we don't buy fizzy drinks because he is obsessive about it when it's in the house

Samantha, a 28-year-old mother of one, and Linda, said they would buy the unhealthy food item but only let their children eat those foods occasionally.

Samantha (FG): I do buy coco pops but he only gets that once or twice a week

Linda: I think we control their sweets. I open the pack and give them a piece but not the whole thing

Others talked about how they keep the unhealthy food items out of reach from children and healthier items where children can easily see or reach.

Anne: I buy snacks and crisps and chocolate but I am the only one who can reach it so they've got to ask me, but I have got cheese and yogurt in the fridge and they have access to that so they know that if they are hungry, want a snack, I just tell them go to the fridge help yourself knowing that they can only reach the food that I feel ok"

Vivek: The fruit bowl is always full and the carrots are always in the fridge and he always can go to the fridge and help himself.

Some parents, however, identified their child as difficult. They thought the child was not getting a healthy enough diet due to the child's 'fussiness.'

Samantha FG: Emily, she is not a very good eater but if you sit there and put the fork in their mouth then she will eat

Meal routine and feeding tactic as a way to control

Participants talked about their mealtime rituals and set routines. Some parents also emphasized the importance of controlling feeding strategies or routines, such as eating family meals together. Many participants identified the practice of eating together as a family and eating breakfast as positive. Some parents also viewed the routine of eating meals together as a social activity.

Nikita: Since age 3 they eat everything on the table and they are not allowed in any other rooms. They know that when it comes to eating they have to be in the kitchen.

Samantha: I work shifts but the children always sit down together to eat their meal always.

Deborah: They have to have breakfast, lunch, dinner and supper at the dining table and we all sit together.

Most parents said that they gave their children food that they thought was healthy and left children to eat on their own, whereas others who identified their child as a fussy or difficult eater said they would completely or partially feed them, irrespective of age.

Bandana: My husband will eat if I am feeding Malya otherwise if my husband is feeding her I would eat so it's kind of not eating together but being together while eating.

Lindsay: If she did not eat as much, I will sit and I feed her.

Vivek: I never sit him down and say you will eat that. Do you know what I mean if there is vegetable just leave them and he will eat it.

Parents identified their child's preference for unhealthy food items as one of the challenges in maintaining a healthy family diet. Many parents talked about how children's food preferences can make it harder or easier for them to control their diet and how it can influence the food environment for the whole family. Parents talked about how their children always try to get the food of their preference in various ways and negotiate to get what they want. A few parents even mentioned that they gave their children the food of their preference to control their behaviour or to avoid conflict.

Panna: he eats jelly baby, he likes jelly baby. I just gave him when I woke him up, not to have tantrum, I give him Jelly beans but I do have control. For older one, every day when they go with pack lunches they do take something with them like a snack.

Lindsay: She does like a sandwich, she will eat loads of sandwiches, jam, spread, cheese, and breakfast she will may be have a breakfast bar or a bowl of cereal or slice of toast.

Most parents who, had more than one child, appeared to make food choices based on children's preferences. Stephanie talked about choosing certain food items for the family meal just because everybody likes them and she does not need to make many items,

Stephanie: If I had my way, we would eat more fresh meat but they kind of dictate what they eat because I hate to waste so I buy what I know they will eat and it makes life easy.

Some other parents talked about how they find a way to make their child eat the food that they don't like.

Nikita: If I make simple spinach and potato she would not eat, but then she likes if I can add it in anything and she does not have to chew.

Beth: she is sometimes reluctant with vegetables but if you mix it up with potato she will eat.

Some parents talked about the food children like or dislike and how children's preferences dictated their diet or eating habits and they as parents gave in to what their child wanted. Morag and Bandana explained that their children's behaviour or refusal to eat meant they could not get their children to eat what they wanted them to eat.

Morag: She does not always eat the amount of food. And in fact she often does not even come to the table. She knows we all sit down at the table and we all eat and she just says she does not fancy it. It's not like she does not know what's going on or anything like that, she just goes I don't want to eat.

Bandana: she wants to play longer and she knows that I will be running behind and I have to feed and that's the game for her so it takes longer time.

Role modelling and involving children as a way of influencing children

Parents did not talk directly about being a role model or using modelling as one of the ways to influence their children's diet. However, some parents talked about their children wanting to eat what they were eating or getting them interested in healthy foods by involving the

children in meal preparation or cooking. They felt these strategies were important in helping their children choose the healthy option.

Nikita: When I am eating they want to try everything, and that's the reason I sit with them

Anne: Yeah, all the cereals, Weetabix and he loves Bran flakes maybe because he sees me eating them because it is a part of my diet

Morag: We do a weekly meal plan where children will be involved as well.

Thus children were involved in the family food environment in different ways such as choosing family meals, observing their parents and/or helping with preparation. Although each parent had a different way of involving their children in the process, they thought it helped them to get their children to eat healthily.

4.6 Discussion

The aim of this qualitative investigation was to explore the social and psychological factors that influenced parents' intentions to provide their children with a healthy diet. The findings demonstrate that influences on parents to provide their children with a healthy diet are multifactorial and goes through a process of socialisations.

Various external factors such as family, social networks, costs of food, health care professionals and internal factors such as parental belief, attitude, perceived control, moral obligation and children's preference were influential in parents' food choices for their children. Parents' food-related cultural background also influenced their family diet.

One of the major external factors that influenced parents' food choice was the higher cost of healthy foods. This finding is consistent with previous studies (Dowler and Dobson, 1997; Gray et al., 2007; Hayter et al., 2013) that showed a relationship between cost of food and family diet. Hayter et al. (2013) found that cost of food was one of the factors influencing parents in their food choice for their young children. While the above studies only focused on low-income families, in the current study participants from areas of high deprivation and low deprivation both identified cost of food as one of the barriers in their attempt to provide healthy diet for their children. Parents' time constraints and the convenience of precooked unhealthy food items were also identified as reasons why parents gave their children unhealthy foods occasionally. These two reasons were often interrelated and also mostly

surfaced in the context of mother's employment. While mother's affordability for more expensive healthier foods were enhanced because of the additional income from their employment, the time constraints caused by employment reduced time for cooking and family eating. Parents solve this by sometimes buying convenience ready-meals such as pizza although they knew it was unhealthy. Some parents thought that children's food preferences made it difficult or easier for them to maintain healthy diet for their children.

While these barriers influenced parental intention to provide healthy diets for their family, positive attitudes and beliefs towards a healthy diet were prominent and emerged as strong internal predictors of healthy family diet. Parents wanted to give a healthy diet to their children despite the barriers. Similar studies in the past have also shown that parental belief about how diet affects the human body can influence the food choice they make for their children (Swanson et al., 2011; Young et al., 2004). Young et al. found that mother's attitude was one of the major factors associated with the consumption of fruits and vegetables by their young children.

Parents talked about their mother or grandmother influencing their food habits and food choices but, interestingly, most of the participants did not indicate their spouse or partner as a strong influence on their food choice.

An interesting aspect of the family diet that this study discovered was that families had spoken or unspoken rules related to food environment in the form of mealtime routine, eating and acceptable food content, and these rules to some extent provided parents control over the family food environment. Most parents were confident in their ability to control children's diet and their dietary habit. Parents talked about how they would control their children's accessibility to unhealthy food in the house and were also comfortable with their children having some unhealthy foods occasionally.

These findings are partially consistent with the theory of planned behaviour. As explained in Section two, the TPB assumes that attitudes, subjective norm and perceived behavioural control can predict behaviour. However parents' sense of moral obligations and responsibility towards children and the influence of culture and religion, which were some of the influences in parental behaviour in current study, are not explained by simple TPB models.

These findings suggest that most parents thought they knew what constituted a healthy diet for their children and could differentiate between healthy and unhealthy dietary items. Many parents' knowledge, however, lacked accuracy, which was reflected in the kind of

“healthy” foods they said they would give to their children. Previous studies indicated a relationship between parental nutrition knowledge and children’s diet. Blaylock et al (1999) found that children were more likely to eat sufficient amount of fruits and vegetables if their mothers had good understanding of the health benefits of fruits and vegetables. This qualitative exploration shows that the gap between parental perception of a healthy diet in general and the accuracy in parental nutrition knowledge can impact upon the foods provided for their children.

4.7 Limitations

Similar to other qualitative studies in general, the current study has some limitations, such as small sample size, and difficulty to confirm the participants’ honesty in answering the questions. However, participants were aware that the ST was a mother and they could relate to ST and were at ease during the interviews. As there was a risk of ST having preconceived ideas about mother’s food practices and a chance of participants being influenced by those ideas, the supervisors read through the transcripts and discussed these on an on-going basis during the data collection period to prevent the influence of ST’s personal views.

4.8 Conclusions

The findings from the qualitative exploration demonstrated that external factors such as food background, media and healthcare professionals, and internal factors such as parents’ motivation, their beliefs and attitudes influenced parental food intentions. Parents identified certain barriers, such as the high cost of healthy foods, convenience and availability of unhealthy foods, maintaining work and life balance and pressure from their social surroundings. Nevertheless, they had a general perception of what a healthy diet is and were often confident in their ability to provide a healthy diet for their family. This study indicated, however, that there were gaps in parents’ nutrition knowledge. In general, parents thought they were giving healthy foods to their children even though it was clear that this was not always the case. Moreover, this study reflected the general perception that unhealthy eating in moderation was acceptable. Therefore, parents’ food-related behaviour and their food choices for their children were influenced by many environmental, social and personal factors. These factors are further explored and incorporated in the quantitative study in Section Five.

Section 5

**The determinants of parental intentions to provide their
children with healthy diets**

Section 5: The determinants of parental intentions to provide their children with healthy diets

5.1 Introduction

Findings from the literature review and the qualitative exploration suggested that influences on family food environment appeared to be multifactorial. It emerged that family food environment was determined by intentions and attitudes, confidence and the influence of significant others within immediate and extended family.

Identifying how these factors influence parents will help in understanding their food-related behaviour. Although the interrelation between psychological factors (e.g. attitudes) and their influence on behaviour is complex, behavioural theories in general and theory of planned behaviour in particular can be useful to provide a theory-based framework to investigate how these factors predict parental intentions. This section will focus on how parental intention is influenced by psychological (eg attitude) and social variables (eg subjective norm). It will examine the influence of parental attitude, subjective norm, perceived behavioural control and moral norm, as well as the effect of external variables (eg demography) on parents' intentions to provide their children with a healthy diet, using the theory of planned behaviour (TPB).

5.2 Aim

The aim is to examine parental behavioural intentions to provide their children with healthier diets within the framework of the theory of planned behaviour using the theory of planned behaviour.

Objectives

To examine the attitudes and beliefs of parents with regard to their intention to provide their children with recommended healthy diet.

To examine the subjective norms and moral norms of parents with regard to their intention to provide their children with recommended healthy diet.

To investigate the behavioural control (self-efficacy) of parents with regard to their intention to provide their children with recommended healthy diet.

To examine the effect of external variables (e.g demographic and dietary knowledge) of parents with regard to their intention to provide their children with recommended healthy diet.

5.3 Hypotheses

Three hypotheses were drawn from the literature review (section two) and the qualitative exploration (section four) to be tested using the TPB.

1. Socioeconomic status and demographic background can influence whether or not parents intend to provide the recommended healthy diet for their children.
2. Parents' intention to provide the recommended healthy diet for their children can be predicted by their attitude, influence of significant others, their perceived control and sense of moral obligation in relation to providing the recommended healthy diet for their children.
3. Parental intention to provide their children with the recommended healthy diet is influenced by their nutrition knowledge.

5.4 Method

Theoretical background

Many studies have used theory of planned behaviour (TPB) (Andrews et al., 2010; Kahlor et al., 2011; Povey et al., 2000; Swanson et al., 2011) to analyse and predict behaviour. The TPB incorporates some of the central concepts in the social and behavioural sciences and provides a social-psychological framework to understand and predict the determinants of human behaviour (Ajzen, 1991). TPB extends the theory of reasoned action by including a third predictor of intentions, perceived behavioral control (PBC), in addition to attitude and subjective norm. TPB functions under the assumption that the actions people carry out are done consciously, so the intention to carry out an action is likely to lead to doing it (Armitage, 2005). According to the TPB, attitudes toward the behaviour, subjective norms and perceived

behavioural control predict the behavioural intention, and behavioural intention human behaviour (Ajzen, 1991).

Attitude

The relationship of attitude with other determinants of human behaviour, and its effect on human behaviour, has been widely researched and reported. Fishbein and Ajzen describe attitude as one of the most commonly investigated concepts within the study of psychology (Fishbein and Ajzen, 1975). In the context of psychological studies, attitude is defined as an individual's favourable or unfavourable evaluation of an object, issue, people or behaviour (Fishbein and Ajzen, 1975). According to the TPB, attitudes are positive or negative evaluations of behaviour. Attitudes are also believed to be associated with positive beliefs and past experiences (Zanna and Rempel, 1988). Eagly and Chaiken (1993) define attitude as a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour. This evaluation takes place as a result of cognitive and behavioural information (Eagly and Chaiken, 1993). People's overall evaluation of behaviour is therefore believed to be reflective of their attitude towards that behaviour. As attitude is a significant predictor of behavioural intention, it is in turn an important predictor of behaviour (Andrews et al., 2010; Swanson et al., 2011).

Subjective norm

In the TPB, subjective norm is defined as a combination of two components termed normative belief and outcome evaluation (Ajzen, 1991). The expectation of significant others or what important others think is the appropriate behaviour in a given situation, is known as normative belief and one's motivation to comply with others' expectations is known as an outcome evaluation. Subjective norms are expected to tap into the social pressure on people to perform or not perform certain behaviours (Ajzen, 1991; Fishbein and Ajzen, 1975). Many behavioural and social studies conducted using the TPB have found that subjective norm can influence and predict behavioural intention and by doing so can indirectly influence behaviour (Duran and Trafimow, 2000; Swanson et al., 2011).

Perceived behavioural control (PBC)

An individual's evaluation of their ability to carry out an action and extent of their control (internal and external) over it is defined as perceived behavioural control (Ajzen, 1991; Duran and Trafimow, 2000). PBC was added to extend the original the theory of reasoned action to develop the TPB, and the inclusion of PBC within TPB accommodates the idea that circumstances beyond one's control can factor in their ability to take actions (Ajzen, 1991). Ajzen argues that people's perceived control, or ability to control the situation, can influence their intention. Thus perceived behavioural control can indirectly influence human behaviour (Povey et al., 2000; Sheeran et al., 2003). Therefore, adding PBC to the original TPB construct together with attitude and subjective norm can increase predictive power (Armitage and Conner, 2000; Povey et al., 2000).

Moral Norm

Moral norm is people's perceived evaluation of moral correctness in performing certain behaviours (Beck and Ajzen, 1991). Moral norm has been added to TPB to improve the predictive power of the model.

Moral norm (sometimes defined as personal normative beliefs) can be employed in parallel with attitude, subjective norm and perceived behavioural control in TPB models. Moral norm is a significant predictor of intentions in studies related to a wide range of behaviours, such as driving over the speed limit (Godin et al., 2005; Parker et al., 1992) smoking in designated areas (Boissonneault and Godin, 1990) and provision of home care (Vermette and Godin, 1996). Studies show that moral norm can have a significant influence on behavioural intention with moral implications (Godin et al., 2005; Manstead, 1988). In a review of moral norm within the TPB, Conner and Armitage (2000) estimated that moral norms predicted an additional 4% of the variance in intentions after controlling for the TPB variables. In analysis of data in six different areas of behaviour Godin (2005) found that participants whose intentions were more aligned with their moral norm were more likely to perform certain behaviours compared with participants whose intentions were more aligned with their attitude (Godin et al., 2005).

Sampling

A purposive sample of parents/primary guardians from the greater Tayside area in Scotland was included for the study. Purposive sampling is used when the sample needs to include a specific population of interest for the research (Tongco, 2007). In this non-random sampling, participants are chosen because of certain qualities they possess that are relevant to the study (Marshall, 1996; Tongco, 2007). Therefore purposive sampling was used for data collection to include only parents or guardians who had pre-school children.

In order to gather data from different socioeconomic groups, participants were chosen from areas of different deprivation levels. The Scottish Index of Multiple Deprivations (SIMD) (2012) was used to identify areas of high and low social deprivation. SIMD (2012) combines indicators across income, employment, health, education, skills and training, housing, geographic access and crime and ranks postcodes (data zones) into deciles from 1-10, where score of 1 indicates most deprived and 10 indicates least deprived for the particular postcode (SIMD 2012).

Study Population and recruitment

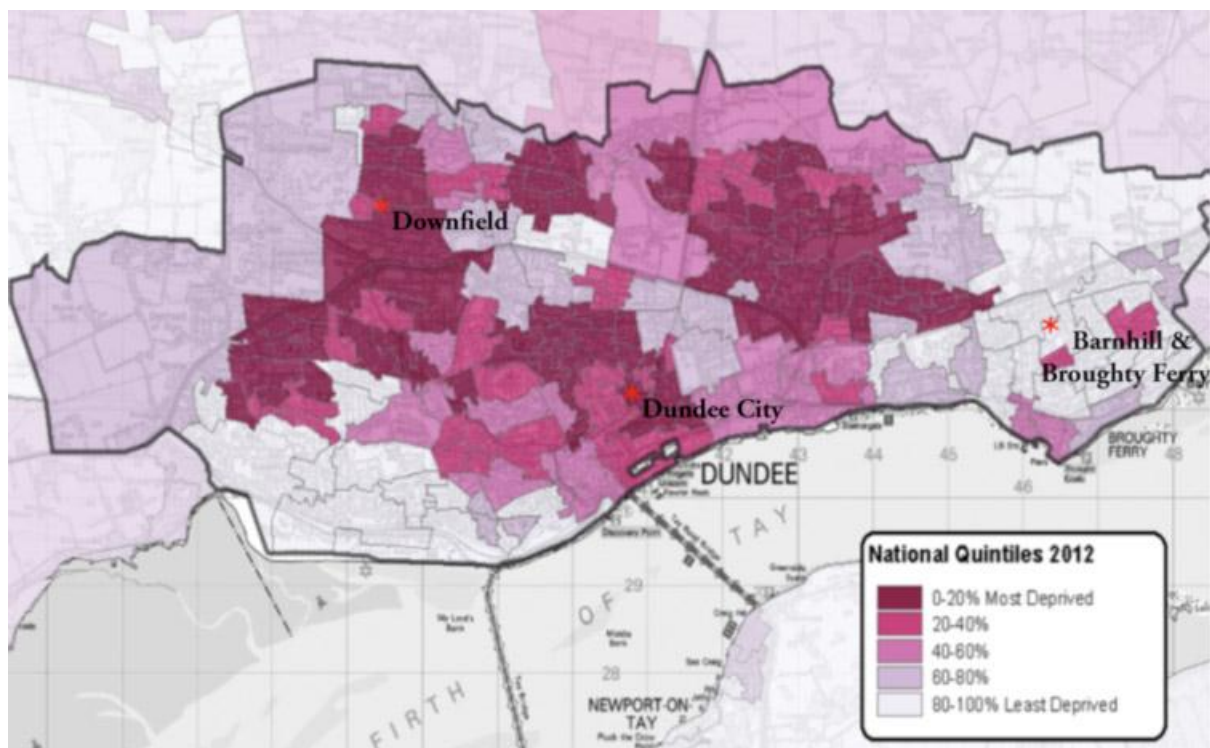
The postcodes were used to determine the nursery and community centres to be recruited for the study. Recruited parents would have at least one child between the ages of 2-5 attending community/school-based nurseries in various areas in Tayside and Angus were included in the study. The study population consisted of all parents whose children attended the included nursery schools or community centres. In addition, these parents were required to fulfil the inclusion criteria and agree to participate. Their children attended school nurseries or community day care centres in Downfield and Dundee city (areas of high social deprivation) or Broughty Ferry and Barnhill (areas of low social deprivation). Figure 5.1 shows the areas of Dundee colour-coded according to their deprivation level. Participants were invited to take part in the survey in coordination with nursery schools and community centres. Nurseries and community centres within the areas of interest were contacted for permission to approach parents and to coordinate visiting times.

Administration of Questionnaires

An information sheet, the questionnaire and the consent form that was to be given to the parents were sent to the nurseries for distribution.

The questionnaire was distributed through the nursery schools or mother and toddler groups' administration. Parents were allowed to complete the questionnaire at the venue or take it home. ST was on hand to answer any questions or provide further information about the study. The participants were asked to sign the consent form and return it with the questionnaire to the researcher in a sealed envelope. Data was collected between May and August 2012.

Figure 5. 1 Map of Dundee



Survey Design

A cross-sectional survey was conducted. Cross-sectional surveys focus on a group of subjects from a defined population at a single point in time, and usually aim to find out the characteristics, prevalence or level of certain attributes within that population. In this kind of

survey, participants are contacted at a fixed point in time and relevant information is obtained from them (Levin, 2006; Mann, 2003). Unlike longitudinal studies, cross-sectional surveys are quicker and cost effective. Loss to follow-up is a common concern in longitudinal studies but there is no loss of subjects due to follow up in cross-sectional surveys as all the required information is collected at one time point (Mann, 2003).

The TPB was used to analyse and predict key behavioural concepts. The literature review findings in the areas of parental behaviour in relation to their children's diet and the findings from qualitative study (Section Four) informed the design of the survey.

The Questionnaire

The questionnaire was divided into 4 sections (Appendix 1):

Section 1 asked about the participant's demography; their age, education, employment, marital status, ethnic background and the number of children and their children's ages.

Section 2 incorporated the variables of the TPB. The TPB questionnaire was based on previously used questions for similar studies (Kahlor et al., 2011; Povey et al., 2000). The questions were designed to examine intention, parents' attitude, subjective norm, parents' perceived behavioural control and moral norm with regards to providing the recommended healthy diet for their children. All of the TPB variables were measured on a 7-point positive Likert scale, where 1 was most negative and 7 was most positive.

Intention

Four questions were asked to measure intention. Parents were asked; 'Do you intend to provide the diet recommended above for your child this week?' and the answers ranged from 1 (definitely not) to 7 (yes definitely), 'How easy will it be for you to provide the diet recommended for your child this week?' and the answers ranged from 1 (extremely hard) to 7 (extremely easy), 'How important is it to provide the diet recommended above for your child this week?' and the answers ranged for 1 (not important at all) to 7 (extremely important) and 'How willing are you to provide the diet recommended above for your child this week?' and the answers ranged from 1 (not at all) to 7 (yes definitely).

Attitude

Questions were asked to find out parents' beliefs and outcome evaluations. The score for each belief and outcome evaluation was multiplied and the subsequent calculations summed to create a total score for attitude. The total attitude score was divided by the number of items in the scale to produce an average score within a range of 1 - 49. Parents were asked how likely (for belief) and how important it was to them personally (for outcome evaluation) that by providing the recommended healthy diet would help control their child's weight, give their child more energy, improve their child's behaviour, help the child stay healthy, help their child enjoy food, prevent their child from becoming obese and prevent their child from getting tooth decay. The answers ranged from 1 (not likely) to 7 (very likely) for belief and 1 (not important at all) to 7 (extremely important) for outcome evaluation.

Subjective norm

Subjective norm was calculated by multiplying normative beliefs and parents' motivation to comply. Scores were then summed to give a total SN score. Normative beliefs were measured by asking how their child, partner, family or healthcare professional would feel if they gave the recommend diet to their child. The answer ranged in scale from 1 very unhappy to 7 very happy. Motivation to comply was measured by asking if they generally do what their partner believes they should do, their family believes they should do, what makes their child happy or what the healthcare professional believes they should do. The answers ranged from 1 (strongly disagree) to 7 (strongly agree). The total subjective norm score was divided by the number of items in the scale to produce an average score that would be within a range of 1 – 49.

Perceived behavioural control

Perceived behavioural control was calculated by multiplying the scores for control belief with the frequency of occurrence. Parents were asked: 'Thinking about providing the recommended diet, how often do you feel that: you don't have enough time to give your child the recommended diet; providing the recommended diet costs too much money; giving them the recommended diet is inconvenient; you don't know which foods are necessary for the recommended diet; it means having an argument with your child you would rather avoid; it means you have to cook; it does not matter because your child chooses their own food; and

you don't have enough skills to prepare the recommended meals'. The answers ranged from 1 (always) to 7 (never). They were also asked how likely the above factors were to influence them in providing the recommended diet for their children. Possible answers ranged from (1) very unlikely to 7 (very likely). The answers ranged from 1 (strongly disagree) to 7 (strongly agree). The total PBC score was divided by the number of items in the scale to produce an average score that would be within a range of 1 – 49.

Moral norm

A set of six questions was asked to measure parents' moral norm. Participants were asked how strongly they agreed or disagreed that, they think of themselves as a healthy eater, their principles dictate that they should give their child the recommended diet, they feel obliged to give their child the recommended diet, they think it is morally wrong to give their child an unhealthy diet, they would feel guilty if they gave their child an unhealthy diet and if they are concerned about the health consequences of what their children eat. The answers ranged from 1 (strongly disagree) to 7 (strongly agree). The total moral norm score was divided by the number of items in the scale to produce an average score, which would be within a range of 1 – 7.

Nutrition knowledge

Sections 3 and 4 of the questionnaire were about parental dietary habits/preferences and nutrition knowledge. Previous studies (Corsini et al., 2010; Joyce and Zimmer-Gembeck, 2009; Wardle et al., 2005) and the findings from the qualitative study (Section Four), indicated that nutrition knowledge was an important factor influencing food choices and the family dietary environment. A modified version of a nutrition knowledge questionnaire (Parmenter and Wardle, 1999) was used. The questionnaire was divided into sections focusing on different aspects of nutrition knowledge such as familiarity of health related terms, awareness of dietary recommendations for healthy eating practices, knowledge of the food sources for healthy diet, making dietary choices based on the information provided and awareness of the influence of diet to cause diseases (Parmenter and Wardle, 1999). This measure has been successfully tested in similar studies and has been validated to provide a clear understanding of the relationship between nutrition knowledge and diet intake. For the purpose of our study some of the questions were changed or replaced to gather specific data about oral health.

Nutrition knowledge scores were coded as 0 for a wrong answer or 'not sure' and 1 for a correct answer. Correct answers were added together to provide a nutrition knowledge score, which ranged from 1-39.

As "healthy diet" was used throughout the questionnaire and could be perceived ambiguously, it was decided that the Food Standard Agency (FSA; 2007) recommendations for a healthy diet would be used as a reference for parents.

Pilot study

The questionnaire was piloted with a group of mothers with similar characteristics to those of the proposed participants, i.e. mothers of pre-school children. The participants in the pilot group were unknown to the study participants and were separate from the main sample. They were asked to complete the questionnaire and make comments on the clarity, layout, and the overall length of the questionnaire. The layout and the wording of some questions were amended, based on the recommendation from the pre-test group to improve readability and clarity. The final questionnaire took approximately 30 minutes to complete.

Ethical considerations

Ethical approval was obtained from the University of Dundee Ethics committee (UREC 12068) (Appendix 2). Participants were assured that their anonymity would be protected at all times and the data would be handled confidentially. They were also made aware that they could withdraw from the study at any time without providing an explanation. Participants were provided with the information sheet, consent form, a questionnaire (Appendix 1), and an envelope.

Statistical analysis

The questionnaire data was coded and entered onto a database using SPSS V19. Ten per cent of the entered questionnaires were randomly selected and double checked for accuracy. All data was then examined for accuracy and missing values prior to analysis by running a frequency distribution. As missing data can potentially increase the risk of bias and minimize the ability to generalise (Chan and Dunn, 1972; Cohen et al., 2003) missing data was replaced by the variable mean. It is known that item mean imputation does not change the overall

variable mean (Cohen, 2003; Tabachnick and Fidell, 2001). Many studies use person-mean imputation where missing values are replaced with the mean score of other items in the scale. However this process is criticised as it can artificially increase reliability, and it is harder to compute a different mean for each person for every missing item (Downey and King, 1998). Frequency of each variable was re-examined to ensure there were no errors in the final data set. In cases where more than twenty five percentage of the responses were missing, the respondents were not included in the analysis.

The categorical data for age, was collapsed into two groups, using a modal split of the most frequent age group which was 26-35-year-old age group. This gave 50% in the younger age band (16-35) and 50% in the older age band (36-46 years and over). For other categorical data a close examination of the frequency distributions suggested that to permit meaningful data analysis they were collapsed into two categories (for example ethnicity). While this improves the data handling it has the potential impact to decrease the specificity and sensitivity of the test of significance.

Final data was subjected to frequency distributions to examine the demographic profile, t-tests to compare the mean scores between groups such as father/mother, single/married, higher education/lower education, living in areas of higher/lower social deprivation, and older/younger. Participants were split into two groups as higher nutrition knowledge for those with the score of more than 19 and lower nutrition knowledge for those who scored 19 or less. As there were three categories for employment, an ANOVA test was carried out to compare the mean scores among participants working full time, part time or not working. Data was subjected to correlation analysis to measure the relationship between intention, attitude, perceived behavioural control and subjective norm.

Regression analysis was carried out to find out which variables could predict intention. Demographic variables were regressed first, followed by theory of planned behaviour variables and finally nutrition knowledge.

Regression analysis is used to investigate the relationship between variables and to determine the predictive effect of the independent variables upon the dependent variable. There are many kinds of regression analyses. The linear regression model works under the assumption that the dependent variable is a linear function of one or more independent variables. Multiple regression analysis is an extension of simple linear regression. This technique can be used to predict the value of a variable as it produces statistical estimates to

indicate how changes in one or more of the independent variables affect the values of the dependent variable. It also allows the determination of the relative contribution of each of the predictors (independent variables) to the overall variance explained.

Reliability

Internal consistency for all TPB variables was measured using Cronbach's alpha provides a measure of the internal consistency of a scale presenting it as a score between 0 and 1. The score describes the extent of interrelatedness of all the items in a scale. An alpha (α) score of above 0.7 is considered acceptable (Nunnally, 1978; Pallant, 2005; Tavakol and Dennick, 2011). However, alpha scores can also be influenced by the number of items in the scale and size of the sample (Nunnally, 1978) and the scale score can be improved by removing items that have a low correlation with other items in the scale (Pallant, 2005). Factor analysis was used to measure the factor loading of individual items within each TPB variables. As the TPB is an established theory and the questions used were previously tested and successfully employed in similar studies, we were confident in the validity and suitability of the model and the questions.

5.5 Results

Sample

A total of 157 questionnaires were distributed and 106 questionnaires were returned giving a response rate of 68%. Among the 106 responses, 4 were discarded as they had more than 25% data missing. The valid response rate was 64%. Of the four discarded responses, all of the respondents were between the ages of 26-35 and mothers. One of them was single and three were married or co-habiting. Three were white and one was from an ethnic minority group. One of the mothers finished secondary school, two had completed college and one was still studying. Two mothers were employed part time and two were employed full time. None of the mothers in this group had any health related qualification. Three said their children spend most the daytime with them and one said with grandparents. Three were from areas of high social deprivation (SIMD decile score 1-5) and one was from a low deprivation area (SIMD decile score 6-10). Although, due to the small sample size, the percentage of the responses were not exactly the same as the valid responses for all variables, the demographic profile of discarded respondents was similar to the valid data.

Demographic profile

Of the 102 participants, 68% were mothers and 31% were fathers or other relationships. Fourteen per cent of the respondents were single, separated, divorced or widowed, 86% were married or cohabiting. Fifty per cent were between the ages of 16-35 and 50% were aged 36 or over. Thirty nine per cent had completed university, 61% completed college, secondary school, primary school or were still studying. Eighty nine per cent were white and 11% were from an ethnic minority group. Eighty two per cent had one child between the ages of 2-5, 17% had 2 children and 1% had 3. Sixty nine per cent said their child spends most of the day with the mother, 31% with father, grandparents, nursery or with child-minder. Seventeen per cent had a healthcare related qualification. Thirty eight per cent were employed full-time, 34% were employed part-time, 28% were not working, full-time parents, students, disabled or too ill to work. Thirty one per cent had low levels of nutrition knowledge and sixty nine per cent had higher level of nutrition knowledge.

Table 5.1 shows the numbers and percentage of the categories under each demographic variable for valid data.

Table 5. 1 Demographic profile of participants

	Frequency	Percentage
Mother	70	68.6
Father or other relatives	32	31.4
Single/separated/divorced/widowed	14	13.7
Married/ Cohabiting	88	86.3
16-35	51	50
36 or over	51	50
Primary, secondary or college/still studying	62	60.8
University	40	39.2
White	91	89.2
Ethnic minority group	11	10.8
Has healthcare qualifications	17	16.7
No healthcare qualifications	85	83.3
Employed full time	39	38.2
Employed part time	35	34.3
Not working /full time parent/student/disabled or too ill to work	28	27.5
Child spends most daytime with mother	70	68.6
Child spends most daytime with father/grandparents/ nursery	32	31.4
Higher deprivation	45	44.1
Lower deprivation	57	55.9
Lower nutrition knowledge	32	31.4
Higher nutrition knowledge	70	68.6

Socioeconomic status

The SIMD decile score of respondents' residential areas ranged from 1 to 10, 1 indicating the area is most deprived and 10 indicating least deprived. Forty four percent of the participants lived in areas with higher social deprivation, 56% lived in areas lower social deprivation.

Parental intentions towards providing the recommended healthy diet for children

The overall score for the intention scale was divided by four to get an average mean score for the items in the range of 1 to 7. The results show that the overall mean score in relation to intention to provide the recommended healthy diet for children was 5.60 (S.D. 1.03), $\alpha=0.80$. Mean score was highest 6.0 (S.D. 1.12) for the question in relation to importance of providing the recommended healthy diet for children that week, while the question asking about the ease of providing the recommended diet had the lowest mean score 5.08 (S.D. 1.36). The mean scores for questions asking if they intend to and are willing to provide the recommended diet that week were 5.4 (S.D. 1.4) and 5.9 (S.D. 1.8) respectively.

Independent sample t-tests were used to compare the overall mean scores between different demographic groups. There was no statistically significant difference in mean behavioural intentions scores by demography (table 5.2). However married or cohabiting parents had greater mean scores than those who were single, divorced or widowed.

The behavioural intention was not influenced by higher 5.57 (S.D. 1.05) compared to those with lower 5.66 (S.D. 1.01) mean nutrition knowledge score [$t(100) = 0.43$; $P=0.66$]

The grouping variable employment status statistically significantly explained the differences in mean behavioural intention [$F(2,99) = 3.92$; $P= 0.02$]. A Bonferroni post-hoc test revealed that parental intention was higher among the parents who were employed part time 5.87 (S.D. 0.80, $P=0.03$) compared with those who were not working 5.74 (S.D. 0.86, $P=0.154$) and those who worked full time 5.25 (S.D. 1.24).

Table 5.2 shows the mean, std. deviation score, significance level and confidence interval for overall intention score in relation to different demographics.

Table 5. 2 Comparisons of mean behavioural intention scores by demography

	N	Mean	S.D.	95% CI	t	df	Sig. 2 tailed
Mother	70	5.64	0.98	-0.30, 0.58	0.65	100	0.52
Father or other relatives	32	5.50	1.15				
Single/ divorced/widowed	14	5.25	1.27	-0.99, 0.18	-1.36	100	0.18
Married/ cohabiting	88	5.65	0.99				
White	91	5.57	1.00	-0.93, 0.38	-0.82	100	0.41
Ethnic minority group	11	5.84	1.34				
Age 16-35	51	5.71	0.86	-0.18, 0.63	1.10	100	0.27
Age 36 or over	51	5.49	1.18				
Primary, secondary or college/studying	62	5.68	0.98	-0.21, 0.62	0.97	100	0.34
University	40	5.48	1.11				
Has healthcare qualifications	17	5.78	1.09	-0.33, 0.76	0.79	100	0.43
No healthcare qualification	85	5.56	1.02				
Child with mother	70	5.57	0.94	-0.52, 0.35	-0.38	100	0.70
Child with father/grandparents/ nursery	32	5.66	1.22				
Higher deprivation	45	5.78	0.91	-0.07, 0.74	1.62	100	0.11
Lower deprivation	57	5.45	1.10				
Lower nutrition knowledge	32	5.66	1.01	-0.34, 0.54	0.43	100	0.67
Higher nutrition knowledge	70	5.57	1.05				

Parental attitude towards providing the recommended healthy diet to their children

Sets of responses on salient beliefs and outcome evaluations were multiplied to produce a total attitude scale. The total score was divided by the number of items and the scores ranged from 1 to 39. Seven items were included in the attitude scale. The results show that the total mean score for attitude was 35.67 (S.D. 10.00), $\alpha = 0.92$.

Looking at the individual items in the total attitude scale highlights that participants had the highest mean score for questions related to the recommended diet helping the child to stay healthy 39.9 (S.D. 10.3) and the lowest mean score was for the recommended diet improving the child's behaviour 32.2(S.D. 13.4).

Table 5. 3 Factor analysis of the individual items in attitude scale

Parental Attitude	Cronbach alpha	Factor loading	Mean
	0.92		35.67 (S.D. 10.00)
Individual items			
Weight		0.83	32.33 (S.D. 13.67)
Energy		0.87	35.09 (S.D. 13.27)
Behaviour		0.87	32.27 (S.D. 13.59)
Stay healthy		0.81	39.93 (S.D. 10.30)
Enjoy food		0.79	32.84 (S.D. 11.71)
Not becoming obese		0.83	37.47 (S.D. 11.52)
Not getting tooth decay		0.77	39.80 (S.D. 10.54)

The results from the independent sample t-tests to compare the total mean scores within different demographic groups show that parental attitude towards providing the recommended healthy diet to their children was not significantly different within any demographic group.

Table 5.4 shows the comparison of mean, standard deviation scores and significance for the overall attitude scale by demographic profile.

Table 5. 4 Comparisons of mean total attitude scores by demography

	N	Mean	S.D.	95% CI	t	df	Sig. -2 tailed
Mother	70	35.82	9.34	-3.80, 4.70	0.21	100	0.83
Father or other relatives	32	35.36	11.45				
Single/ divorced/widowed	14	31.46	13.85	-13.05, 3.28	-1.28	100	0.22
Married/ Cohabiting	88	36.35	9.17				
White	91	35.60	10.00	-7.09, 5.63	-0.23	100	0.82
Ethnic minority group	11	36.32	10.45				
16-35	51	34.80	9.96	-5.68, 2.19	-0.88	100	0.38
36 or over	51	36.55	10.06				
Primary/secondary/college/still studying	62	36.35	9.66	-2.30, 5.75	0.85	100	0.40
University	40	34.63	10.53				
Has healthcare qualifications	17	36.17	10.74	-4.70, 5.89	0.22	100	0.83
No healthcare qualifications	85	35.58	9.90				
Child with mother	70	35.48	10.20	-4.88, 3.62	-0.29	100	0.77
Child with father/ grandfather/nursery	32	36.11	9.69				
Higher deprivation	45	35.32	10.69	-4.61, 3.34	-0.32	100	0.75
Lower deprivation	57	35.96	9.50				
Lower nutrition knowledge	32	37.73	8.53	-1.21, 7.21	1.41	100	0.16
Higher nutrition knowledge	70	34.73	10.52				

Parental subjective norm with regards to providing the recommended healthy diet to their children

Sets of responses on the opinion of significant others and motivation to comply with their expectation were multiplied to form the subjective norm score (SN). The overall SN score was divided by the number of items and the mean score ranged from 1-49. Internal consistency for SN was better when the question regarding the healthcare professionals was deleted from the original scale, therefore this item was discarded. The result shows that the overall mean score for subjective norm with regards to providing a healthy diet for their children was 25.02 (S.D. 10.86) $\alpha = 0.66$.

The frequency distribution of individual items in the subjective norm scale shows that items relating to the child had the highest mean score 27.47 (S.D. 7.15) and items relating to a partner or spouse had the lowest mean score 23.74 (S.D. 11.51).

Table 5. 5 Factor analysis of the individual items in subjective norm excluding healthcare professional

Parental Subjective norm	Cronbach alpha	Factor loading	Mean
	0.66		25.02 (S.D. 10.86)
Individual items			
Child		0.56	27.47 (S.D. 17.14)
Partner		0.87	23.74 (S.D. 11.51)
Family		0.90	23.84(S.D. 12.10)

Table 5. 6 Factor analysis of the individual items in subjective norm including healthcare professionals

Parental Subjective norm	Cronbach alpha	Factor loading	Mean
	0.46		27.45
Individual items			
Child		0.56	27.47 (S.D. 17.14)
Partner		0.87	23.74 (S.D. 11.51)
Family		0.90	23.84 (S.D. 12.10)
Health professional		0.33	39.93 (S.D. 31.50)

Participants from ethnic minority group had significantly higher mean subjective norm scores 32.98 (S.D. 11.76) than white participants 24.05 (S.D. 10.41), [t (100) = -2.65: P=0.009]

Subjective norm mean was higher for participants who had lower nutrition knowledge 28.06 (S.D. 11.97) than those who had higher nutrition knowledge 23.62 (S.D. 10.11). This score was approaching statistical significance, [t (100) = 1.94: P= 0.055].

Table 5.7 shows the mean, std. deviation and significance score for overall subjective norm scale.

Table 5. 7 Comparisons of mean subjective norm scores by demography

	N	Mean	S.D.	95% CI	t	df	Sig. (2 tailed)
Mother	70	24.87	11.48	-5.08, 4.16	-0.20	100	0.84
Father or other relatives	32	25.33	9.54				
Single/divorced/widowed	14	26.92	11.60	-4.00, 8.43	0.71	100	0.48
Married/ cohabiting	88	24.71	10.78				
White	91	24.05	10.41	-15.61, -	-2.65	100	0.01
Ethnic minority group	11	32.98	11.76				
16-35	51	25.49	11.43	-3.33, 5.24	0.44	100	0.66
36 or over	51	24.54	10.36				
Primary/secondary/college/ studying	62	25.16	11.49	-4.02, 4.77	0.17	100	0.87
University	40	24.79	9.95				
Has healthcare qualifications	17	24.55	11.46	-6.31, 5.20	-0.19	100	0.85
No healthcare qualifications	85	25.11	10.81				
With mother	70	24.33	10.94	-6.80, 2.41	-0.95	100	0.35
With father/grandparents/nursery	32	26.52	10.72				
Higher deprivation	45	26.37	11.57	-1.86, 6.72	1.12	100	0.26
Lower deprivation	57	23.94	10.25				
Lower nutrition knowledge	32	28.06	11.97	-0.09, 8.98	1.94	100	0.06
Higher nutrition knowledge	70	23.62	10.11				

Parental perceived behavioural control (PBC) towards providing the recommended healthy diet to their children

Perceived difficulty items and frequency of occurrence were multiplied to measure PBC. The overall score was divided by the number of items and the mean score ranged from 1-49. The result shows that the overall mean PBC score for providing a healthy diet for their children was 13.60 (S.D. 6.83) $\alpha = 0.88$.

The frequency distribution of individual items on the PBC scale shows that the highest score was in relation to the item about having an unnecessary argument with the child while giving the recommended diet to the child 15.35 (S.D. 8.40) while the lowest mean score was for the item related to having to cook to provide children with a healthy diet 10.85 (S.D. 8.12).

Table 5. 8 Factor analysis of the individual items in PBC

Parental PBC	Cronbach alpha	Factor loading	Mean
	$\alpha = 0.88$.		13.60 (S.D. 6.83)
Individual items			
Time		0.71	15.19 (S.D. 9.10)
Cost		0.82	14.29 (S.D. 9.53)
Convenience		0.85	13.90 (S.D. 8.87)
Knowledge		0.79	12.59 (S.D. 8.24)
Having argument with child		0.71	15.35 (S.D. 8.40)
Having to cook		0.72	10.85 (S.D. 8.12)
Skills		0.79	13.02 (S.D. 9.09)

Independent sample t-test of the overall mean score for the PBC scale between different demographic groups shows that participants whose children spend most of the day with a mother had significantly higher PBC 14.50 (S.D. 7.53) than those whose children spent most of the day with a father, grandparents or nursery, 11.62 (S.D. 4.43), [t (91)=2.01: P=0.05].

Table 5.9 shows the mean score, standard deviation and significance of PBC among different demographic groups.

Table 5. 9 Comparisons of mean perceived behavioural control scores by demography

	N	Mean	S.D.	95% CI	t	df	Sig.-2 tailed
Mother	70	13.72	7.02	-2.51, 3.30	0.27	100	0.79
Father or other relatives	32	13.33	6.48				
Single/ divorced/widowed	14	12.71	5.90	-4.94, 2.88	-0.52	100	0.60
Married/ cohabiting	88	13.74	6.98				
White	91	13.73	6.75	-3.15, 5.52	0.54	100	0.59
Ethnic minority group	11	12.54	7.71				
16-35	51	14.26	7.50	-1.37, 4.00	0.97	100	0.33
36 or over	51	12.94	6.08				
Primary/secondary/college/still studying	62	13.42	6.09	-3.21, 2.31	-0.32	100	0.75
University	40	13.87	7.91				
Has healthcare qualifications	17	13.40	6.67	-3.85, 3.38	-0.13	100	0.90
No healthcare qualifications	85	13.64	6.90				
Child with mother	70	14.50	7.53	0.03, 5.73	2.01	100	0.05
Child with father/ grandparent/nursery	32	11.62	4.43				
Higher deprivation	45	13.51	6.04	-2.88, 2.55	-0.12	100	0.91
Lower deprivation	57	13.67	7.44				
Lower nutrition knowledge	32	14.40	7.74	-1.73, 4.06	0.80	100	0.43
Higher nutrition knowledge	70	13.23	6.39				

Parental moral norm

Six questions were included to produce the moral norm scale. The overall mean score for the moral norm scale was 32.7 (S.D. 6.1) $\alpha=0.80$.

Table 5. 10 Factor analysis of the individual items in moral norm

Parental Moral Norm	Cronbach alpha	Factor loading	Mean
	$\alpha=0.80$		32.7 (± 6.1)
Individual items			
Consider myself healthy eater		0.54	5.17 (S.D. 1.40)
Principal		0.86	5.67 (S.D. 1.23)
Feel obliged		0.68	5.24 (S.D. 1.58)
Morally wrong to give unhealthy		0.81	5.24 (S.D. 1.59)
Feel guilty		0.78	5.78 (S.D. 1.28)
Concerned about the consequence		0.64	5.66 (S.D. 1.45)

The frequency distribution of individual items on the moral norm scale highlighted that the highest score was in relation to feeling guilty if they gave the child an unhealthy diet 5.8 (S.D. 1.3) and lowest score was in relation to thinking of own self as a healthy eater 5.2 (S.D. 1.4).

Independent sample t-tests comparing the overall moral norm mean score within different demographic groups show that participants from the ethnic minority group had a higher moral norm 5.97 (S.D. 1.05) than white participants, 5.39 (S.D. 1.00), [$t(100) = -1.79$: $P=0.08$], 95% CI = -1.21, 0.06, although this was only just approaching significance.

Table 5.11 shows the mean score, standard deviation and significance level moral norm score among different demographic categories.

Table 5. 11 Mean, Standard deviation and significance for moral norm

	N	Mean	S.D.	95% CI	t	df	Sig.(2-tailed)
Mother	70	5.48	1.04	-0.35, 0.52	0.40	100	0.69
Father or other relatives	32	5.40	0.98				
Single/divorced/widowed	14	5.37	0.92	-0.68, 0.48	-0.34	100	0.73
Married/ cohabiting	88	5.47	1.04				
White	91	5.39	1.00	-1.21, 0.06	-1.79	100	0.08
Ethnic minority group	11	5.97	1.05				
16-35	51	5.46	1.03	-0.40, 0.40	0.01	100	0.99
36 or over	51	5.46	1.02				
Primary/secondary/ college/studying	62	5.35	1.04	-0.67, 0.14	-1.28	100	0.20
University	40	5.62	0.97				
Has healthcare qualifications	17	5.56	0.99	-0.41, 0.66	0.46	100	0.64
No healthcare qualifications	85	5.44	1.03				
With mother	70	5.37	1.08	-0.71, 0.15	-1.29	100	0.20
With father /grandparents nursery	32	5.65	0.85				
Higher deprivation	45	5.54	0.94	-0.25, 0.56	0.75	100	0.45
Lower deprivation	57	5.39	1.08				
Lower nutrition knowledge	32	5.31	1.20	-0.64, 0.22	-0.96	100	0.34
Higher nutrition knowledge	70	5.52	0.92				

Parental nutrition knowledge

Nutrition knowledge scores were coded to 1 for right answer and 0 for wrong or not sure. A total of 39 questions were asked in different categories. So the possible score range was 0-39. Total mean score across the demography ranged from 4 to 29. The overall mean score for

the nutrition knowledge scale was 20.83 (S.D. 4.23).

Independent sample t-tests were carried out to compare means for different demographic categories and showed that those who completed university had significantly higher nutrition knowledge 22.22 (S.D. 3.52) than those who had not 19.94 (S.D. 4.42), [$t(100) = -2.75$; $P=0.01$], 95% CI = -3.93, -0.64. Table 5.12 shows the mean score and standard deviation of total nutrition knowledge score across various demographic groups.

Table 5. 12 Comparisons of mean Nutrition Knowledge scores by demography

Nutrition Knowledge	N	Mean	S.D.	95% CI	t	df	Sig. (2-tailed)
Mother	70	21.05	4.07	-1.08, 2.50	0.79	100	0.43
Father or other relatives	32	20.34	4.58				
Single/ divorced/widowed	14	19.57	5.60	-3.87, 0.95	-1.20	100	0.23
Married/ cohabiting	88	21.03	3.97				
White	91	20.93	4.24	-1.73, 3.63	0.70	100	0.48
Ethnic minority group	11	19.98	4.19				
16-35	51	20.76	3.52	-1.81, 1.53	-0.17	100	0.87
36 or over	51	20.90	4.87				
Primary/secondary/college/studying	62	19.94	4.42	-3.93, -0.64	-2.75	100	0.01
University	40	22.22	3.52				
Has healthcare qualifications	17	20.41	5.42	-2.74, 1.73	-0.45	100	0.66
No healthcare qualifications	85	20.92	3.98				
Child with mother	70	21.08	3.51	-0.99, 2.59	0.89	100	0.38
Child with father	32	20.28	5.50				
Higher deprivation	45	20.42	4.76	-2.41, 0.93	-0.88	100	0.38
Lower deprivation	57	21.16	3.76				

Correlation between TPB variables

Correlations were computed between intention, attitude, subjective norm, perceived behavioural control and moral norm on 102 participants using Pearson's 2 tailed bivariate correlations. Results showed that the correlations were statistically significant at the 0.01 level between intention, attitude, subjective norm and moral norm. Perceived behavioural control was not significantly correlated to any other TPB variables.

Intention was significantly and positively related to attitude ($r = 0.61$ $P < 0.01$), subjective norm ($r = 0.397$ $P < 0.01$) and moral norm ($r = 0.547$, $P = 0.01$), showing that as intention increased attitude, subjective norm and moral norm also increased. It was negatively correlated with perceived behavioural control but was not statistically significant ($r = -0.087$, $P = 0.42$).

Subjective norm was significantly related to attitude ($r = 0.461$ $P < 0.01$), moral norm ($r = 0.403$ $P < 0.01$) and intention ($r = 0.397$ $P < 0.01$). As subjective norm increased so did attitude, moral norm and intention.

Moral norm was significantly related to intention ($r = 0.55$, $P < 0.01$), attitude ($r = 0.55$, $P < 0.01$), subjective norm ($r = 0.37$, $P < 0.01$) but not PBC ($r = -0.05$, $P = 0.65$). It indicates that intention, attitude and subjective norm increased as moral norm increased.

The highest significant correlation was between intention and attitude ($r = 0.61$ $P < 0.01$) followed by moral norm and attitude ($r = .54$, $P < 0.01$).

Table 5. 13 Correlation analysis of TPB components

	1	2	3	4	5	Mean	S.D.
1. Intention	1					5.60	1.03
2. Attitude	0.614**	1				35.67	10.00
3. Subjective norm	0.397**	0.461**	1			25.02	10.86
4. Perceived behavioural control	-0.081	0.067	0.114	1		13.60	6.83
6. Moral Norm	0.547**	0.547**	0.403**	-0.046	1	5.46	1.02

** Correlation is significant at the 0.01 level (2-tailed).

Multiple regressions were carried out to investigate the predictive ability of demographic and socioeconomic variables on intention. Demographic variables were divided into two

categories for the regression, with reference categories as mother, married/cohabiting, white, older parent and higher deprivation. As there were three categories for employment, dummy variables were created with working part time as a reference category.

The result revealed that these variables were statistically significant in predicting parental intention [$F(8, 92) = 2.03$; $P < 0.05$, $R^2 = 0.08$]. The individual contribution of employment to the total variance explained was significant for part-time employment ($P = 0.002$) and for not working ($P = 0.02$) (Table 5.14). This suggested that part-time employed participants were more likely to intend to give their child the recommended healthy diet than parents who were not working or were in full time employment.

Table 5. 14 Regression of Demographic variables

	Standardized Coefficients				
	Beta	t	Sig.	95% CI	
(Constant)		11.23	0.001	4.77	6.82
Relation with child	-0.15	-1.25	0.214	-0.84	0.19
Marital status	0.18	1.80	0.075	-0.05	1.12
Ethnic background	-0.07	-0.73	0.468	-0.87	0.41
Age	-0.19	-1.74	0.086	-0.85	0.06
Education	-0.04	-0.37	0.713	-0.50	0.34
Social Deprivation	-0.07	-0.64	0.522	-0.58	0.30
Employed part-time	0.40	3.18	0.002	0.32	1.40
Unemployed	0.31	2.48	0.015	0.14	1.28
Child's daytime	-0.18	-1.69	0.095	-0.86	0.07

$F(9,92)=2.03$; $P < 0.05$; $R^2 = 0.08$

A multiple regression analysis was conducted to predict intention from total attitude, total subjective norm and perceived behavioural control. The results showed that these variables significantly predicted intention [$F(3, 98) = 22.88$; $P < 0.001$], $R^2 = 0.39$. Attitude was significantly predictive of intention, however, the predictive power was not significant for subjective norm ($P = 0.07$) and perceived behavioural control ($P = 0.09$). Thirty nine percent of variance in behavioural intention was explained by the model (Table 5.15).

Table 5. 15 Regression of attitude, subjective norm and perceived behavioural control with Intention

	Standardized Coefficients				
	Beta	t	Sig.	95% CI	
(Constant)		10.47	0.001	2.81	4.13
Attitude	0.55	6.30	0.001	0.04	0.08
Subjective Norm	0.16	1.81	0.07	-0.01	0.03
Perceived Behavioural control	-0.14	-1.74	0.08	-0.04	0.01

$F(3, 98) = 22.88, P < 0.001, R^2 = 0.39.$

The result from a multiple regression analysis adding moral norm to attitude, subjective norm and perceived behavioural control to predict intention showed that these variables predicted intention [$F(4, 97) = 20.55; P < 0.001, R^2 = 0.44$]. Attitude and moral norm were both significantly predictive of intention. However the subjective norm ($P = 0.23$) and perceived behavioural control ($P = 0.15$) were not significant. With the inclusion of moral norm an additional 5% of the variance in the behavioural intention was explained (Table 5.16). When nutrition knowledge was included as an additional independent variable, only total attitude and moral norm predicted the behavioural intention. This explained 44% of the variance (Table 5.17).

Table 5. 16 Regression of attitude, subjective norm, perceived behavioural control and moral norm with intention

	Standardized coefficients				
	Beta	t	Sig.	95% CI	
(Constant)		5.50	0.001	1.61	3.43
Attitude	0.43	4.54	0.001	0.02	0.06
Subjective Norm	0.11	1.21	0.228	-0.01	0.03
Perceived Behavioural Control	-0.11	-1.44	0.152	-0.04	0.01
Moral Norm	0.27	2.9	0.005	0.09	0.46

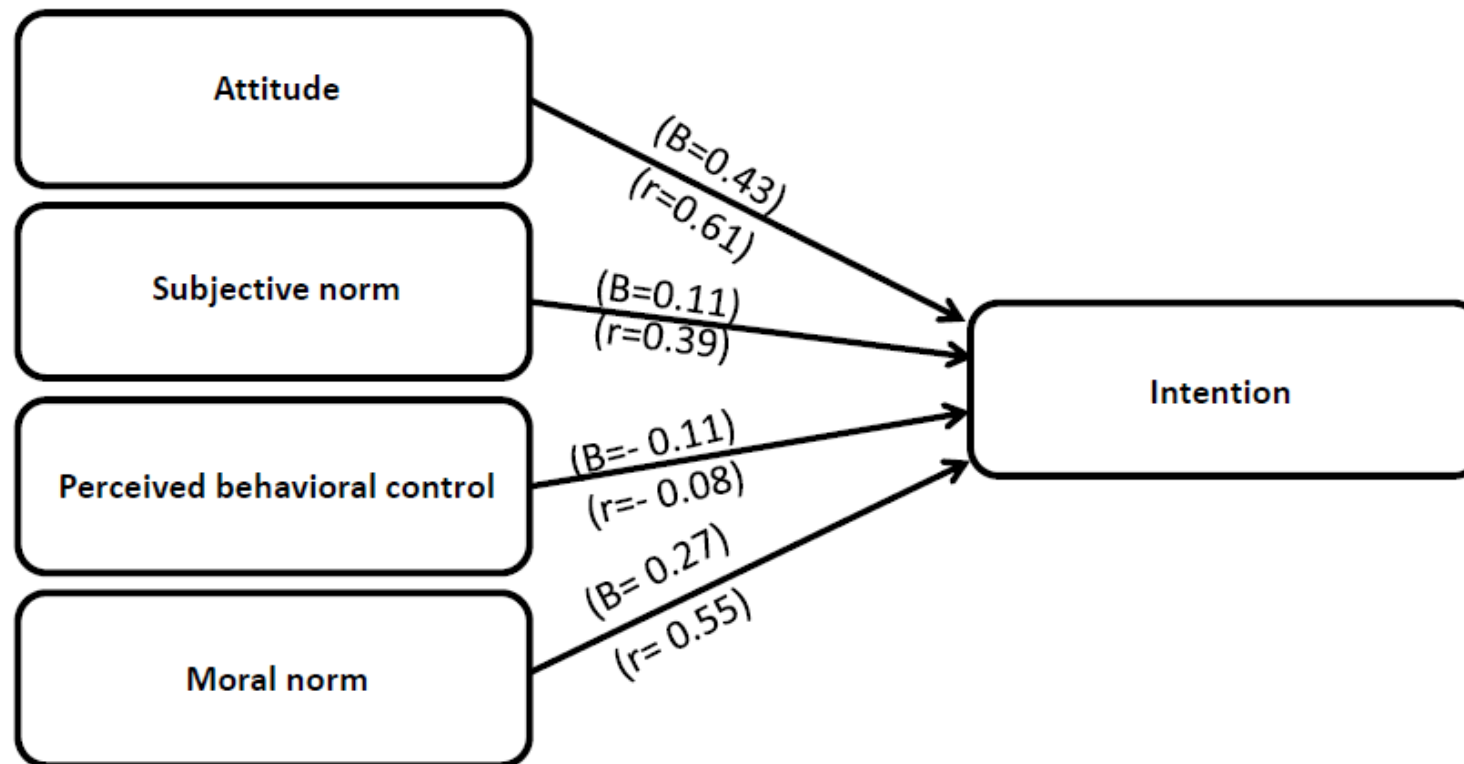
$F(4, 97) = 20.55, P < 0.001, R^2 = 0.44$

Table 5. 17 Regression of attitude, subjective norm, perceived behavioural control, moral norm and nutrition knowledge with intention

	Standardized coefficients				
	Beta	t	Sig.	95% CI	
(Constant)		5.50	0.001	1.61	3.43
Attitude	0.43	4.54	0.001	0.02	0.06
Subjective Norm	0.13	1.51	0.228	-0.01	0.03
Perceived Behavioural Control	-0.11	-1.44	0.152	-0.04	0.01
Moral Norm	0.27	2.81	0.005	0.09	0.46
Nutrition Knowledge	-0.01	-0.08	0.939	-0.35	0.33

F (5, 96) = 16.58, P<0.001, R^2 =0.44

Figure 5. 2 Linear regression analysis of the TPB variables



5. 6 Discussion

Parents play a vital role in their children's diet. Children's diet is directly linked to their health and wellbeing. Poor diet is associated with health problems. In this context, it is important to understand what factors influence parents in providing their children with a healthy diet. The aim of this study was to investigate the factors that influence parents' intentions to provide their children with a recommended healthy diet. Most studies on children's diet and their diet-related health focus on the factors that contribute towards their food intake. This study is unique in that it investigates Scottish parents' intention and their predictors with regards to providing a recommended healthy diet for children aged 2-5 years.

The findings from the study demonstrate significant positive parental intentions and attitudes towards providing a healthy diet for children.

Socioeconomic status and demographic background

Regression analyses of socio-demographic variables on parental intention showed that 8% of the total variance in intention could be explained by these variables, where employment status of the parent was statistically significant. This is consistent with some previous studies in terms of association between parental employment and children's diet (Hawkins et al., 2007; Moser et al., 2012; Tucker, 1983) Hawkins, 2007). However, there is conflicting evidence on the impact of parental employment on family or children's diet. Mosser et al (2012) found that maternal employment was associated with the amount of time mothers and children spent in diet-related activities, such as food preparation and eating together, in families with children aged 10 -17 and so children of parents who worked were more likely to eat alone, dine out and eat convenience foods. In a cohort study including parents of young children, Hawkins et al (2007) also found that mothers' long working hours were associated with their children's obesity. On the other hand, Tucker et al (1983) concluded that mothers' employment was positively associated with improved family diet due to the increased income (Tucker, 1983). The findings from the current study which suggests that these parents, from the sample population studied, who worked part-time were more likely to intend to give healthy diet for their children therefore contradicts with the above studies. However, these studies focused on the association between maternal employment and its impact on family diet or children's health and did not investigate parental intention.

In the current study, parents from the sample population studied, who spent time at home with their children had a higher intention to provide them with the recommended healthy diet. It is possible that this was because the mothers who choose to spend time at home with their children were more involved in their children's general wellbeing and provision of a healthy diet. This finding only had a tendency towards significance but could have been statistically significant with a larger sample size. There are studies demonstrating the association between parental time constraints and childcare arrangements due to employment and the impact on their children's diet or diet-related health problems (Hawkins et al., 2007). The findings from here provide additional and specific evidence for the influence of day-care arrangement on children's diet through parental intention.

For the sample population studied, parents' age was also shown to be an influence upon their behavioural intention to give their children the recommended healthy diet. Although some studies indicate a relationship between parental age, their feeding strategy or mealtime structure (Arredondo et al., 2006; Brown et al., 2008), there is a lack of substantial evidence from published literature on the impact of parents' age on their intention to give the recommended healthy diet to their children.

From this study, parents from the sample population studied who were married or living with a partner also had a higher intention score with regard to giving their children a healthy diet. This finding is supported by previous studies that suggested that children with two parents had a better diet and diet-related health than the children living with a single parent (Strauss and Knight, 1999; Wolfe and Campbell, 1993). A study conducted among primary school children concluded that children living with single parents were more likely to skip breakfast and eat less fruits and vegetables compared to children who were living with two parents (Wolfe and Campbell, 1993). Another study also found that children living with single mothers were more likely to be obese by the age of 6 (Strauss and Knight, 1999), thus supporting the findings here.

While for the sample population studied parental intention and attitude were not significant with regard to demography, differences based on demographic variables were statistically significant for some TPB components. For instance, for the sample population studied participants from ethnic minority background had significantly higher subjective norm and moral norm compared to white participants, indicating that these participants tend to be more influenced by their spouse, family members and children with regards to their

children's diet and they feel morally obliged to provide the recommended healthy diet for their children. It may be suggested that this may be because of the acculturation and gap in food preference in different generations of migrant families. As mothers who grew up in different food environments are more likely to be uncertain about the food culture, preparation and nutrient values of certain food items in their new food environment, they are more likely to be influenced by people around them. This is in line with the implication from a focus group study related to the determinants of family diet that found race and ethnicity as important factors in the context of social norm (Kahlor et al., 2011).

Even though the result was not statistically significant, the current study also indicates that for the sample population studied parents of children who spend most of the daytime with mothers had better PBC. As mothers are more involved in preparing meals for family (Moser et al., 2012) if they stay at home with their children during the day, they are likely to have more time at home to plan and prepare meals for children and be with the child while they are eating. They, therefore, feel more in control of the diet they provide for their children as opposed to participants who spent daytime away from their children. This finding is consistent with a study by Wardle and colleagues that showed that parental control influenced eating behaviours of pre-school children (Wardle et al., 2005).

Previous studies have shown an association between children's diet, their health and their demographic background and/or socioeconomic status (Gillespie and Achterberg, 1989; Vue et al., 2011). Socioeconomic status of the family and neighbourhood were not a significant factor in directly explaining parental intention in this study. This may be because the participants, who were recruited through their child's nursery or day care centres, are engaged parents, taking part in community activities, and therefore are more likely to be aware of their children's dietary needs regardless of their demographic background and socioeconomic status. Therefore, other social and personal factors such as social capital or social engagement might be more important in explaining differences in intention and behaviour.

Parents' intention, attitude, subjective norm, perceived behavioural control and moral norm

Consistent with TPB assumptions attitude, subjective norm and moral norm were correlated with intention, and attitude and moral norm were predictive of intention. These findings

confirm the usefulness of TPB for behavioural studies investigating parental intention with regards to children's wellbeing.

The theory of planned behaviour has been used in many studies related to various behaviours (Andrews et al., 2010; Kahlor et al., 2011; Povey et al., 2000; Swanson et al., 2011). These studies indicate that attitude is one of the significant predictor of intention. Parents' intention to provide the recommended healthy diet for their children was significantly correlated to attitude in the current study. Attitude was also the strongest predictor of intention. This finding is consistent with previous studies demonstrating positive parental attitudes towards their behaviour related to their children. (Andrews et al., 2010; Kahlor et al., 2011; Povey et al., 2000; Swanson et al., 2011). In a study investigating the dietary behaviour of children aged 2-5, Swanson et al (2011) found that attitude and norm were related to parental intention. As parents in the current study were asked about their attitude towards something that might be beneficial for their children, it was predicted that they would display more positive attitude. As stated earlier, the participants who were involved in their children's upbringing by taking them to nurseries and day care centres are more likely to be aware of health benefits of healthy diet and as a result would demonstrate positive attitude towards giving healthy diet to their children as well.

For the sample population studied parents' moral norm was also predictive of their intention. As children's wellbeing is in general seen as a parental responsibility, parents might view giving the recommended healthy diet to their children as their moral obligation. They are, therefore more likely to want to give them healthy diet or feel guilty if they cannot do so. Other studies have found that people's moral norm and feeling of moral obligation influence their intention, especially with regard to behaviour with moral implications (Godin et al., 2005). However existing literature lacks substantial evidence on the impact of moral norm on parental intention with regard to behaviour that benefits their children.

From the current study, subjective norm did not predict intention. Other studies have shown that subjective norm is not significant in predicting intention (Godin and Kok, 1996; Sheppard et al., 1988). This could be because people may not be aware of others' influence on their behaviour. Alternatively, many other indirect societal factors, such as culture, media may be more influential rather than immediate family and this remains an area for further research.

Perceived behavioural control was not significantly related to, and could not predict the behavioural intention to provide a healthy diet. The current literature suggest that, there is conflicting evidence with regards to predictive power of perceived behavioural control on intention. Some studies have shown an association between perceived behavioural control and healthy eating in preschool children (Beale and Manstead, 1991; Wardle et al., 2005) and understanding of intention (Godin et al., 1993), while others indicate its lack of predictability for intention. This also remains an area for future work.

Parental intention and nutrition knowledge

Nutrition knowledge did not predict intention in this study. Some previous studies have reported a relationship between nutrition knowledge and children's dietary intake (Bere and Klepp, 2004; Triches and Giugliani, 2005), however, these studies were mainly focused on the relationship between the nutrition knowledge of both parents and children and their dietary behaviour rather than parental nutrition knowledge and intention.

Participants with lower nutrition knowledge also had higher subjective norm score compared to the participants with higher nutrition knowledge. Subjective norm was significantly higher for participants from ethnic minority group than white participants. This suggests that participants from ethnic minority background and those with lower nutrition knowledge tend to be more influenced by what their spouse and family members think they should do or what makes their children happy with regards to children's diet.

Limitations

As all the participants were contacted through the nurseries and child care centres, it can be argued that these parents are socially engaged and are expected to be better aware about nutrition knowledge and involved in promoting their children's wellbeing. Therefore, even though the sample included participants with varying socio-demographic background from areas of both lower and higher social deprivation levels, some parents who are not socially engaged and can be expected to represent different socioeconomic status may not have been represented in this study.

Finally as the sample size was small for some statistical measures, significance of some of the outcomes may be unstable. As cross-sectional surveys can only provide a snapshot, it is difficult to determine causal associations between outcomes and long-term exposure to a

cause.

Conclusions

In conclusion, this cross-sectional study showed that behavioural intention was predicted by attitude and moral norm (components of TPB). Moreover demography had a secondary role and knowledge regarding diet and healthy eating was not predictive of behavioural intentions. Therefore this research questions the influence of health education upon parental dietary intentions and highlights the importance of personal beliefs and their evaluations as reflected in the prediction of behavioural intention by attitude and moral norms.

Section 6

Conclusions and Recommendations

Section 6: Conclusions and recommendations

6.1 Thesis overview

The aim of this thesis was to investigate the factors that influence parents' intention to provide their children with healthier diets.

The literature review presented in Section two provides evidence for the direct relationship between diet and health. Through the use of an ecological model, it showed that various complex factors such as global environment, social surrounding and personal circumstances influence the family food environment and children's diet. It also shows that psychological and behavioural theories can be useful frameworks to understand parental behaviour with regard to their children.

The findings from the qualitative study presented in Section Four demonstrate that for the sample population studied parental food intentions and behaviour is influenced by external factors such as food background, media and healthcare professionals, and internal factors such as parents' motivation, their belief and attitudes. Positive parental intentions and attitudes towards healthy diets for their family and children have also been highlighted by this study. Parents identified certain barriers, such as influence from their social networks, the high cost of healthy foods, convenience and availability of unhealthy foods and maintaining work and life balance. They, however, had a general perception of what a healthy diet is and were often confident in their ability to provide a healthy diet for their family. Parents thought they were giving healthy foods to their children even though it was clear that this was not always the case indicating however that there were gaps in parents' nutrition knowledge. This study reflected the general acceptability of unhealthy eating in moderation.

The findings from the quantitative study presented in Section Five demonstrated that for the sample population studied parental attitudes, moral norm and subjective norm can directly influenced parents' intention to provide a healthy diet for their children. This study also adds to the evidence base on the use of the TPB, since attitude and moral norm significantly predicted parental intention to provide the recommended healthy diet for children. Although not statistically significant, this study demonstrated a trend that socioeconomic status of the family and parental nutrition knowledge affected parental intention. In contrast with the qualitative study, parents' perceived behavioural control was

not significant, indicating that parents do not necessarily perceive barriers to giving their children a healthy diet.

6.2 Limitations

As the structured literature review was not a systematic review, some relevant studies may not have been included. However, the comprehensive and thorough review of the literature included provides a strong background for using behavioural theories to understand parental behaviour related to children's diet.

This current work did not use a randomised sampling technique but adopted a purposive sampling method. While it is acknowledge that this reduces the generalizability of the findings, purposive sampling permits the answering of the research questions for the targeted population.

The investigation did not measure the parents' actual dietary behaviours since this would have been resource intensive. Food diaries would have been an extra burden to the participants (O'Neil, 2001), and may have provided an approximate measure of dietary intake (Pikholz et al., 2004; Samuel-Hodge et al., 2004). Nevertheless the value of using the TPB is that because the behavioural intention is assessed within the same time interval, context, target as the behaviour under study, then according to theorists (Ajzen and Fishbein 1980), it will predict behaviour.

6.3 Conclusions

It is evident that diet plays an important role in children's health and wellbeing. Poor diet is directly associated with poor oral and general health outcomes. Furthermore, dietary habits acquired at a young age tend to persist throughout adulthood. Therefore, improving children's diet and dietary habits have the potential to improve their health and reduce the chances of diseases such as diabetes, coronary heart disease and cancer in later life.

The Scottish Government recognises the importance of a healthy start in life and the importance of diet for good health (Nutritional Guidance for Early Years, 2006). Consequently, it has made a commitment to improving people's health and wellbeing. Many policies and initiatives have been implemented targeting the early years. Care standards and guidelines have been drawn up to ensure healthy eating practices in nurseries and other institutions caring for children, and providing information for parents and carers with regards to healthy

diet. The need for parental involvement in improving children's diet has also been recognised. Policies such as the Scottish Diet Action Plan (1996), Eat Well (2007) and Nutritional Guidance for Early Years (2006) specifically focus on improving children's diet. Despite these policy efforts, the healthy diet standards that are being established in institutions such as schools and nurseries are not always reflected within the family environment. Children appear to be consuming poor diets, consisting of more sugar and saturated fat and less fruits and vegetables than the recommended amounts for a healthy balanced diet (Scottish Health Survey, 2012). The influence of poor diet amongst Scottish children has also been demonstrated through poor health conditions such as obesity and poor oral health.

Considering the strong influence that parents have in determining children's diet, especially for younger children, it is crucial that they and the policy makers understand the factors that influence parental behaviour, choice and intention in providing and maintaining healthy diet for their young children. This thesis probes these factors and provides a better understanding of determinants of parental intentions to provide a healthy diet for their children.

In conclusion this study demonstrated that for the sample population studied parents have positive attitudes and intentions with regards to providing a healthy diet for their children. The work suggests that parents felt morally obliged to provide healthy diets for their children and family. Further investigation on the influence of social deprivation and inequalities in children's diet, using a larger sample, is called for here, since the predictive element of socioeconomic status did not reach significance and would provide some important evidence on the impact of social inequalities and cultural factors in children's diet and health. As parental food background and exposure was found to influence the family diet, it is important to further explore the influence of culture and religion in dietary behaviour within the families in ethnic minority communities.

It is also important to explore qualitatively parents' actual dietary behaviour, by following families over a longer time period, to provide additional evidence to help improve the diet of young children.

In summary, this work showed that parents intend, but are not always able, to provide healthy diets for their children. Therefore, interventions aimed at improving children's diet could benefit from addressing the gap between intentions and behaviour, perhaps through addressing food pricing policies, sociocultural practices such as convenience foods, work-life

balance policies and introducing children to healthier foods as early as possible to influence their dietary preferences.

6.4 Recommendations

It is proposed that two sets of recommendations may be made in accordance with external and internal influences that affect parents' intentions to provide their children with a healthier diet.

[1] External influence recommendations

- I. It is recommended that policies and legislation are put in place to regulate the costs of healthier foods to enable parents to make 'the healthy choice the easy choice'
- II. It is recommended that nursery schools and community centre where mother and toddler groups meet, are provided with evidence-based guidelines to enable the provision of healthier foods and snacks for children.

[2] Internal influence recommendations

It is recommended that parents should be encouraged to understand their role in their child's food choice development, so they may assist their children to choose healthy foods and drinks. It may be suggested in order to facilitate this process that parents should be empowered 'to make the healthy choice the easy choice' by increasing the range of their cooking skills and so improve confidence (self-efficacy) and promote healthier eating in the family settings.

Section 7

References

Section 7: References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes* 50, 179-211.
- Ajzen, I. and Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour*. Englewood-Cliff. NJ Prentice-Hall Inc.
- Andrews, K.R., Silk, K.S., and Eneli, I.U. (2010). Parents as health promoters: a theory of planned behavior perspective on the prevention of childhood obesity. *Journal of Health Communication* 15, 95-107.
- Armitage, C.J. (2005). Can the theory of planned behavior predict the maintenance of physical activity? *Health Psychology* 24, 235-245.
- Armitage, C.J., and Conner, M. (2000). Social cognition models and health behaviour: A structured review. *Psychology and Health* 15, 173-189.
- Arredondo, E.M., Elder, J.P., Ayala, G.X., Campbell, N., Baquero, B., and Duerksen, S. (2006). Is parenting style related to children's healthy eating and physical activity in Latino families? *Health Education Research* 21, 862-871.
- Axelson, M.L. (1986). The impact of culture on food-related behavior. *Annual Review of Nutrition* 6, 345-363.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist* 44, 1175-1184.
- Bandura, A. (2001). Social cognitive theory: an agentic perspective. *Annual Review of Psychology* 52, 1-26.
- Baric, L. (1972). The behavioral sciences as a basis for health education. In: L. Baric, ed. *Behavioral Sciences for Health and Disease*. Geneva: International Journal of Health Education.
- Baric, L. (1979). Health education within the framework of primary socialization. New pathways in health education. *Medizinische Klinik* 74, 1648-1652.
- Bazzano, L.A., He, J., Ogden, L.G., Loria, C., Vupputuri, S., Myers, L., and Whelton, P.K. (2002). Dietary intake of folate and risk of stroke in US men and women: NHANES I Epidemiologic Follow-up Study. National Health and Nutrition Examination Survey. *Stroke* 33, 1183-1188.
- Beale, D.A., and Manstead, A.S.R. (1991). Predicting Mothers' Intentions to Limit Frequency of Infants' Sugar Intake: Testing the Theory of Planned Behavior. *Journal of Applied Social Psychology* 21, 409-431.

Beck, L., and Ajzen, I. (1991). Predicting dishonest actions using the theory of planned behavior. *Journal of Research in Personality* 25, 285-301.

Beirens, T.M., Brug, J., van Beeck, E.F., Dekker, R., den Hertog, P., and Raat, H. (2008). Assessing psychosocial correlates of parental safety behaviour using protection motivation theory: stair gate presence and use among parents of toddlers. *Health Education Research* 23, 723-731.

Bere, E., and Klepp, K.I. (2004). Correlates of fruit and vegetable intake among Norwegian schoolchildren: parental and self-reports. *Public Health Nutrition* 7, 991-998.

Beshara, M., Hutchinson, A., and Wilson, C. (2010). Preparing meals under time stress. The experience of working mothers. *Appetite* 55, 695-700.

Bicchieri, C. (2006). *The Grammar of Society: The Nature and Dynamics of Social Norms*. New York: Cambridge University Press.

Boissonneault, E., and Godin, G. (1990). The prediction of intention to smoke only in designated work site areas. *Journal of Occupational Medicine* 32, 621-624.

Braun, V., and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology* 3, 77-101.

Broadley, M.R., White, P.J., Bryson, R.J., Meacham, M.C., Bowen, H.C., Johnson, S.E., Hawkesford, M.J., McGrath, S.P., Zhao, F.J., Breward, N., et al. (2006). Biofortification of UK food crops with selenium. *Proceedings of the Nutrition Society* 65, 169-181.

Brown, K.A., Ogden, J., Vogeley, C., and Gibson, E.L. (2008). The role of parental control practices in explaining children's diet and BMI. *Appetite* 50, 252-259.

Bryant, C.A., Courtney, A., Markesbery, B.A., and Dewalt, A. (1985). *The Cultural Feast: An Introduction to Food and Society*. 1st ed. Minnesota: West Publishing.

Burnier, D., Dubois, L., and Girard, M. (2011). Exclusive breastfeeding duration and later intake of vegetables in preschool children. *European Journal of Clinical Nutrition* 65, 196-202.

Burns, C., Jackson, M., Gibbons, C., and Stoney, R.M. (2002). Foods prepared outside the home: association with selected nutrients and body mass index in adult Australians. *Public Health Nutrition* 5, 441-448.

Cairns, G., Angus, K., Hastings, G., and Caraher, M. (2013). Systematic reviews of the evidence on the nature, extent and effects of food marketing to children. A retrospective summary. *Appetite* 62, 209-215.

Campbell, K., Andrianopoulos, N., Hesketh, K., Ball, K., Crawford, D., Brennan, L., Corsini, N., and Timperio, A. (2010). Parental use of restrictive feeding practices and child BMI z-score. A 3-year prospective cohort study. *Appetite* 55, 84-88.

- Campbell, K.J., Crawford, D.A., and Hesketh, K.D. (2007). Australian parents' views on their 5-6-year-old children's food choices. *Health Promotion International* 22, 11-18.
- Chan, L.S., and Dunn, O.J. (1972). The treatment of missing values in discriminant analysis-I. The sampling experiment. *Journal of American Statistical Association* 67, 473-477
- Charmaz, K. (1990). 'Discovering' chronic illness: using grounded theory. *Social Science & Medicine* 30, 1161-1172.
- Clark, H.R., Goyder, E., Bissell, P., Blank, L., and Peters, J. (2007). How do parents' child-feeding behaviours influence child weight? Implications for childhood obesity policy. *Journal of Public Health* 29, 132-141.
- Coesens, C., De Mol, J., De Bourdeaudhuij, I., and Buysse, A. (2010). The role of interpersonal influence in families in understanding children's eating behavior: a social relations model analysis. *Journal of Health Psychology* 15, 1267-1278.
- Cohen, J., Cohen, P., West, S.G., and Aiken, L.S. (2003). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. 3rd ed. New Jersey: Lawrence Erlbaum.
- Cohen, M.P. (2003). Imputation Allowing Standard Variance Formulas. *Journal of Data Science* 1, 275-292.
- Cole-Hamilton, I., Gunner, K., Leverkus, C., and Starr, J. (1986). A study among dietitians and adult members of their households of the practicalities and implications of following proposed dietary guidelines for the UK: British Dietetic Association Community Nutrition Group Nutrition Guidelines Project. *Human nutrition. Applied nutrition* 40, 365-389.
- Comrey, A.L., and Lee, H.B. (1992). *A First Course in Factor Analysis*. New Jersey: Lawrence Erlbaum.
- Contento, I.R. (2007). *Nutrition Education: Linking Research, Theory, and Practice*. London: Jones and Bartlett.
- Corsini, N., Wilson, C., Kettler, L., and Danthiir, V. (2010). Development and preliminary validation of the Toddler Snack Food Feeding Questionnaire. *Appetite* 54, 570-578.
- Crocker, H., Whitaker, K.L., Cooke, L., and Wardle, J. (2009). Do social norms affect intended food choice? *Preventive Medicine* 49, 190-193.
- Cummins, S., Petticrew, M., Higgins, C., Findlay, A., and Sparks, L. (2005). Large scale food retailing as an intervention for diet and health: quasi-experimental evaluation of a natural experiment. *Journal of Epidemiology and Community Health* 59, 1035-1040.

Darmon, N., and Drewnowski, A. (2008). Does social class predict diet quality? *American Journal of Clinical Nutrition* 87, 1107-1117.

Dawar, N., and Parker, P. (1994). Marketing universals: consumers' use of brand name, price, physical appearance, and retailer reputation as signals of product quality. *Journal of Marketing* 58, 81-95.

Denzin, N.K., and Lincoln, Y.S. (2000). *Handbook of qualitative research*. 2nd ed. California: Sage.

Dowler, E.A., and Dobson, B.M. (1997). Nutrition and poverty in Europe: an overview. *Proceedings of the Nutrition Society* 56, 51-62.

Downey, R.G., and King, C. (1998). Missing data in Likert ratings: A comparison of replacement methods. *Journal of General Psychology* 125, 175-191.

Drewnowski, A., and Specter, S.E. (2004). Poverty and obesity: the role of energy density and energy costs. *American Journal of Clinical Nutrition* 79, 6-16.

Duran, A., and Trafimow, D. (2000). Cognitive organization of favorable and unfavorable beliefs about performing a behavior. *Journal of Social Psychology* 140, 179-187.

Eagly, A.H., and Chaiken, S. (1993). *The Psychology of Attitudes*. Texas: Harcourt, Brace & Janovich.

Everitt, S. (1975). Multivariate analysis: The need for data, and other problems. *British Journal of Psychiatry* 126, 237-240.

Field, A. (2005). *Discovering Statistics Using SPSS*. 2nd ed. London: Sage.

Fishbein, M. and Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Ontario: Addison-Wesley.

Fisher, J.O., Arreola, A., Birch, L.L., and Rolls, B.J. (2007). Portion size effects on daily energy intake in low-income Hispanic and African American children and their mothers. *American Journal of Clinical Nutrition* 86, 1709-1716.

Fisk, C.M., Crozier, S.R., Inskip, H.M., Godfrey, K.M., Cooper, C., and Robinson, S.M. (2011). Influences on the quality of young children's diets: the importance of maternal food choices. *British Journal of Nutrition* 105, 287-296.

Food Standard Agency (2007) The eatwell plate. Available at: <http://www.nhs.uk/Livewell/Goodfood/Documents/Eatwellplate.pdf> [Accessed on 19th February 2012]

Freud, A. (1951). Observations on child development. In *Selected Writings Anna Freud*. R. Ekins, R. Freeman (eds). Bury St Edmunds. Penguin Books. 1998.

Gable, S., and Lutz, S. (2000). Household, Parent, and Child Contributions to Childhood Obesity. *Family Relations* 49, 293-300.

Gibson, S.A. (1997). Non-milk extrinsic sugars in the diets of pre-school children: association with intakes of micronutrients, energy, fat and NSP. *British Journal of Nutrition* 78, 367-378.

Gillespie, A.H., and Achterberg, C.L. (1989). Comparison of family interaction patterns related to food and nutrition. *Journal of the American Dietetic Association* 89, 509-512.

Glaser, B.G., and Strauss, A.L. (1967). *The discovery of grounded theory*. Chicago: Aldline.

Godin, G., Conner, M., and Sheeran, P. (2005). Bridging the intention-behaviour 'gap': the role of moral norm. *The British Journal of Social Psychology* 44, 497-512.

Godin, G., and Kok, G. (1996). The theory of planned behavior: a review of its applications to health-related behaviors. *American Journal of Health Promotion* 11, 87-98.

Godin, G., Valois, P., and Lepage, L. (1993). The pattern of influence of perceived behavioral control upon exercising behavior: an application of Ajzen's theory of planned behavior. *Journal of Behavioral Medicine* 16, 81-102.

Gray, V.B., Byrd, S.H., Cossman, J.S., Chromiak, J., Cheek, W.K., and Jackson, G.B. (2007). Family characteristics have limited ability to predict weight status of young children. *Journal of the American Dietetic Association* 107, 1204-1209.

Gross, L.S., Li, L., Ford, E.S., and Liu, S. (2004). Increased consumption of refined carbohydrates and the epidemic of type 2 diabetes in the United States: an ecologic assessment. *American Journal of Clinical Nutrition* 79, 774-779.

Haerens, L., De Bourdeaudhuij, I., Barba, G., Eiben, G., Fernandez, J., Hebestreit, A., Kovacs, E., Lasn, H., Regber, S., Shiakou, M., et al. (2009). Developing the IDEFICS community-based intervention program to enhance eating behaviors in 2- to 8-year-old children: findings from focus groups with children and parents. *Health Education Research* 24, 381-393.

Halford, J.C., Gillespie, J., Brown, V., Pontin, E.E., and Dovey, T.M. (2004). Effect of television advertisements for foods on food consumption in children. *Appetite* 42, 221-225.

Harrison, K., and Marske, A.L. (2005). Nutritional content of foods advertised during the television programs children watch most. *American Journal of Public Health* 95, 1568-1574.

Hawkins, S.S., Griffiths, L.J., Dezateux, C., and Law, C. (2007). The impact of maternal employment on breast-feeding duration in the UK Millennium Cohort Study. *Public Health Nutrition* 10, 891-896.

Hayden, C., Bowler, J.O., Chambers, S., Freeman, R., Humphris, G., Richards, D., and Cecil, J.E. (2013). Obesity and dental caries in children: a systematic review and meta-analysis. *Community Dentistry and Oral Epidemiology* 41, 289-308.

Hayter, A.K., Draper, A.K., Ohly, H.R., Rees, G.A., Pettinger, C., McGlone, P., and Watt, R.G. (2013). A qualitative study exploring parental accounts of feeding pre-school children in two low-income populations in the UK. *Maternal & Child Nutrition*. doi: 10.1111/mcn.12017

Jabs, J., and Devine, C.M. (2006). Time scarcity and food choices: an overview. *Appetite* 47, 196-204.

Jetter, K.M., and Cassady, D.L. (2006). The availability and cost of healthier food alternatives. *American Journal of Preventive Medicine* 30, 38-44.

Jones, L.R., Steer, C.D., Rogers, I.S., and Emmett, P.M. (2010). Influences on child fruit and vegetable intake: sociodemographic, parental and child factors in a longitudinal cohort study. *Public Health Nutrition* 13, 1122-1130.

Joyce, J.L., and Zimmer-Gembeck, M.J. (2009). Parent feeding restriction and child weight. The mediating role of child disinhibited eating and the moderating role of the parenting context. *Appetite* 52, 726-734.

Kahlor, L., Mackert, M., Junker, D., and Tyler, D. (2011). Ensuring children eat a healthy diet: a theory-driven focus group study to inform communication aimed at parents. *Journal of Pediatric Nursing* 26, 13-24.

Kavanagh, K.F., Habibi, M., Anderson, K., and Spence, M. (2010). Caregiver- vs infant-oriented feeding: a model of infant-feeding strategies among special supplemental nutrition program for women, infants, and children participants in rural east Tennessee. *Journal of the American Dietetic Association* 110, 1485-1491.

Kavey, R.E. (2010). How sweet it is: sugar-sweetened beverage consumption, obesity, and cardiovascular risk in childhood. *Journal of the American Dietetic Association* 110, 1456-1460.

Kline, P. (1979). *Psychometrics and psychology*. London: Acaderric Press.

Kline, R.B. (1998). *Principles and Practice of Structural Equation Modeling*. New York: Guilford.

Kruger, R., and Gericke, G.J. (2003). A qualitative exploration of rural feeding and weaning practices, knowledge and attitudes on nutrition. *Public Health Nutrition* 6, 217-223.

Kumanyika, S.K. (2008). Environmental influences on childhood obesity: ethnic and cultural influences in context. *Physiology and Behavior* 94, 61-70.

Latini, D.M., Chan, J.M., Cowan, J.E., Arredondo, S.A., Kane, C.J., Penson, D.F., DuChane, J., and Carroll, P.R. (2006). Health-related quality of life for men with prostate cancer and diabetes: a longitudinal analysis from CaPSURE. *Urology* 68, 1242-1247.

Levin, K.A. (2006). Study design III: Cross-sectional studies. *Evidence-based Dentistry* 7, 24-25.

Lewis, M., and Worobey, J. (2011). Mothers and toddlers lunch together. The relation between observed and reported behavior. *Appetite* 56, 732-736.

Lockey, A.S., and Hardern, R.D. (2001). Decision making by emergency physicians when assessing cardiac arrest patients on arrival at hospital. *Resuscitation* 50, 51-56.

Loehlin, J.C. (1992). *Latent Variable Models: An introduction to factor, path and structural analysis*. 2nd ed. New Jersey: Lawrence Erlbaum.

Lumeng, J.C., Cardinal, T.M., Jankowski, M., Kaciroti, N., and Gelman, S.A. (2008). Children's use of adult testimony to guide food selection. *Appetite* 51, 302-310.

Lupton, D.A. (2005). Lay discourses and beliefs related to food risks: an Australian perspective. *Sociology of Health & Illness* 27, 448-467.

Maguire, A., and Rugg-Gunn, A.J. (2003). Xylitol and caries prevention--is it a magic bullet? *British Dental Journal* 194, 429-436.

Mann, C.J. (2003). Observational research methods. Research design II: cohort, cross sectional, and case-control studies. *Emergency Medicine Journal* 20, 54-60.

Manstead, A.S.R. (2000). The role of moral norm in the attitude-behavior relationship. In: Terry, Deborah J. and Hogg, Michael A. eds. *Attitudes, Behavior and Social Context: the Role of Norms and Group Membership*, Applied Social Research Series. New Jersey: Lawrence Erlbaum, pp. 11-30.

Marshall, M.N. (1996). Sampling for qualitative research. *Family Practice* 13, 522-525.

Marshall, T.A., Eichenberger-Gilmore, J.M., Broffitt, B.A., Warren, J.J., and Levy, S.M. (2007). Dental caries and childhood obesity: roles of diet and socioeconomic status. *Community Dentistry and Oral Epidemiology* 35, 449-458.

Mazur, R.E., Marquis, G.S., and Jensen, H.H. (2003). Diet and food insufficiency among Hispanic youths: acculturation and socioeconomic factors in the third National Health and Nutrition Examination Survey. *American Journal of Clinical Nutrition* 78, 1120-1127.

McCurdy, K., and Gorman, K.S. (2010). Measuring family food environments in diverse families with young children. *Appetite* 54, 615-618.

McIntyre, K.M., Setzkorn, C., Baylis, M., Waret-Szkuta, A., Caminade, C., Morse, A.P., Akin, S.A., Huynen, M., Martens, P., and Morand, S. (2010). Impact of climate change on human and animal health. *Veterinary Record* 167, 586.

McLeod, E.R., Campbell, K.J., and Hesketh, K.D. (2011). Nutrition knowledge: a mediator between socioeconomic position and diet quality in Australian first-time mothers. *Journal of the American Dietetic Association* 111, 696-704.

Mobley, C., Marshall, T.A., Milgrom, P., and Coldwell, S.E. (2009). The contribution of dietary factors to dental caries and disparities in caries. *Academic Pediatrics* 9, 410-414.

Morgan, D.L., and Krueger, R.A. (1993). *Successful focus groups: Advancing the state of the art*. A Sage Focus ed. California: Sage.

Morris, R.T. (1956). A typology of norms. *American Sociological Review* 21, 610-613.

Moser, A., Chen, S.E., Jilcott, S.B., and Nayga, R.M. (2012). Associations between maternal employment and time spent in nutrition-related behaviours among German children and mothers. *Public Health Nutrition* 15, 1256-1261.

Mullen, P.D., Hersey, J.C., and Iverson, D.C. (1987). Health behavior models compared. *Social Science and Medicine* 24, 973-981.

Munro, S., Lewin, S., Swart, T., and Volmink, J. (2007). A review of health behaviour theories: how useful are these for developing interventions to promote long-term medication adherence for TB and HIV/AIDS? *BMC Public Health* doi:10.1186/1471-2458-7-104

National Dental Inspection Programme (2012). Available at: <http://www.isdscotland.org/Health-Topics/Dental-Care/National-Dental-Inspection-Programme/> [Accessed: 10 November 2013]

Newbrun, E. (1982). Sucrose in the dynamics of the carious process. *International Dental Journal* 32, 13-23.

Nicklaus, S., Boggio, V., Chabanet, C., and Issanchou, S. (2005). A prospective study of food variety seeking in childhood, adolescence and early adult life. *Appetite* 44, 289-297.

NRC (1989). *Diet and health: implications for reducing chronic disease risk*. N.R. Council ed. Washington DC: National Academy Press.

Nunnally, J.C. (1978). *Psychometric Theory*. New York: McGraw-Hill.

Nyberg, G., Sundblom, E., Norman, A., and Elinder, L.S. (2011). A healthy school start - parental support to promote healthy dietary habits and physical activity in children: design and evaluation of a cluster-randomised intervention. *BMC Public Health* doi:10.1186/1471-2458-11-185

O'Neil, P.M. (2001). Assessing dietary intake in the management of obesity. *Obesity Research* 5, 361-366.

Office of Communications (2007). *Television Advertising of Food and Drink Products to Children*. <http://stakeholders.ofcom.org.uk/consultations/foodads/summary> [Accessed: 12 June 2013].

Orlet Fisher, J., Rolls, B.J., and Birch, L.L. (2003). Children's bite size and intake of an entree are greater with large portions than with age-appropriate or self-selected portions. *American Journal of Clinical Nutrition* 77, 1164-1170.

Ostbye, T., Zucker, N.L., Krause, K.M., Lovelady, C.A., Evenson, K.R., Peterson, B.L., Bastian, L.A., Swamy, G.K., West, D.G., and Brouwer, R.J. (2011). Kids and adults now! Defeat Obesity (KAN-DO): rationale, design and baseline characteristics. *Contemporary Clinical Trials* 32, 461-469.

Pagnini, D.L., Wilkenfeld, R.L., King, L.A., Booth, M.L., and Booth, S.L. (2007). Mothers of pre-school children talk about childhood overweight and obesity: The Weight of Opinion Study. *Journal of Paediatrics and Child Health* 43, 806-810.

Pallant, J. (2005). *SPSS Survival Manual*. 2nd ed. Open University Press: McGraw-Hill.

Parker, D., Manstead, A.S., Stradling, S.G., and Reason, J.T. (1992). Determinants of intention to commit driving violations. *Accident Analysis and Prevention* 24, 117-131.

Parmenter, K., and Wardle, J. (1999). Development of a general nutrition knowledge questionnaire for adults. *European Journal of Clinical Nutrition* 53, 298-308.

Patrick, H., and Nicklas, T.A. (2005). A review of family and social determinants of children's eating patterns and diet quality. *Journal of the American College of Nutrition* 24, 83-92.

Pope, C., Ziebland, S., and Mays, N. (2000). Qualitative research in health care. Analysing qualitative data. *British Medical Journal* 320, 114-116.

Potter, J., and Wetherell, M. (1987). *Discourse and social psychology: Beyond attitudes and behaviour*. London: Sage.

Povey, R., Conner, M., Sparks, P., James, R., and Shepherd, R. (2000). The theory of planned behaviour and healthy eating: Examining additive and moderating effects of social influence variables. *Psychology and Health* 14, 991-1006.

Redding, C.A., Rossi, J.S., Rossi, S.R., Velicer, W.F., and Prochaska, J.O. (2000). Health Behavior Models. *International Electronic Journal of Health Education* 3, 180-193.

Rippetoe, P.A., and Rogers, R.W. (1987). Effects of components of protection-motivation theory on adaptive and maladaptive coping with a health threat. *Journal of Personality and Social Psychology* 52, 596-604.

Ritchie, J., and Lewis, J. (2003). *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. London: Sage.

Ritchie, J., and Spencer, L. (1994). *Analyzing qualitative data*. London: Routledge.

Rogers, R.W. (1975). Protection motivation theory and knowledge of household safety hazards as predictors of parental home safety behaviors. *Journal of Psychology* 91, 93-114.

Rosenstock, I.M., and (1974). Historical origins of the health belief model. *Health Education Monographs* 2, 336-353.

Rosenstock, I.M., Strecher, V.J., and Becker, M.H. (1988). Social learning theory and the Health Belief Model. *Health Education Quarterly* 15, 175-183.

Salt, A., Freeman, K., Prusa, A., Ferret, N., Buffolano, W., Malm, G., Schmidt, D., Tan, H.K., Gilbert, R.E., and Petersen, E. (2005). Determinants of response to a parent questionnaire about development and behaviour in 3 year olds: European multicentre study of congenital toxoplasmosis. *BMC Pediatrics* doi: 10.1186/1471-2431-5-21.

Samuel-Hodge, C.D., Fernandez, L.M., Henriquez-Roldan, C.F., Johnston, L.F., and Keyserling, T.C. (2004). A comparison of self-reported energy intake with total energy expenditure estimated by accelerometer and basal metabolic rate in African-American women with type 2 diabetes. *Diabetes Care* 27, 663-669.

Scaglioni, S., Salvioni, M., and Galimberti, C. (2008). Influence of parental attitudes in the development of children eating behaviour. *British journal of nutrition* 99 (Suppliment 1), S22-S25.

Scottish Government (2006). *Nutritional guidance for early education and childcare settings for children aged 1-5*. Edinburgh.

Sheeran, P., Trafimow, D., and Armitage, C.J. (2003). Predicting behaviour from perceived behavioural control: tests of the accuracy assumption of the theory of planned behaviour. *British Journal of Social Psychology* 42, 393-410.

Sheiham, A. (2001). Dietary effects on dental diseases. *Public Health Nutrition* 4, 569-591.

Sheiham, A., and Watt, R.G. (2000). The common risk factor approach: a rational basis for promoting oral health. *Community Dentistry and Oral Epidemiology* 28, 399-406.

Sheppard, B.H., Hartwick, J., and Warshaw, P.R. (1988). The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of Consumer Research* 15, 325-343.

Shimamura, S. (1974). A cohort survey on on carries attacks in permanent teeth durign a period of approximately 20 kg of annual sugar consumption per person in Japan. *Dental Health Journal* 24, 46-52

Smith, C.P. (1992). *Motivation and Personality: Handbook of Thematic Content Analysis*. London: Cambridge University Press.

Smith, J., and Firth, J. (2011). Qualitative data analysis: the framework approach. *Nurse Researcher* 18, 52-62.

Spruijt-Metz, D., Lindquist, C.H., Birch, L.L., Fisher, J.O., and Goran, M.I. (2002). Relation between mothers' child-feeding practices and children's adiposity. *American Journal of Clinical Nutrition* 75, 581-586.

Sreebny, L.M. (1982). Sugar availability, sugar consumption and dental caries. *Community Dentistry and Oral Epidemiology* 10, 1-7.

Srivastava, A., and Thomson, S.B. (2009). Framework Analysis: A Qualitative Methodology for Applied Policy Research 4, 72-79.

Stevens, J.P. (1996). *Applied multivariate statistics for the social sciences*. 3rd ed. New Jersey: Lawrance Erlbaum.

Strauss, R.S., and Knight, J. (1999). Influence of the home environment on the development of obesity in children. *Pediatrics* [Online]. Available at: <http://pediatrics.aappublications.org/content/103/6/e85.long> [Accessed 23 June 2013]

Stuckler, D., McKee, M., Ebrahim, S., and Basu, S. (2012). Manufacturing epidemics: the role of global producers in increased consumption of unhealthy commodities including processed foods, alcohol, and tobacco. *PLoS Medicine* doi: 10.1371/journal.pmed.1001235.

Sturm, R. (2005). Childhood obesity - what we can learn from existing data on societal trends, part 2. *Preventing Chronic Disease* 2,(Special topic) A20.

Swanson, V., and Power, K.G. (2005). Initiation and continuation of breastfeeding: theory of planned behaviour. *Journal of Advanced Nursing* 50, 272-282.

Swanson, V., Power, K.G., Crombie, I.K., Irvine, L., Kiezebrink, K., Wrieden, W., and Slane, P.W. (2011). Maternal feeding behaviour and young children's dietary quality: a cross-sectional study of socially disadvantaged mothers of two-year old children using the theory of planned behaviour. *International Journal of Behavioral Nutrition and Physical Activity* doi: 10.1186/1479-5868-8-65

Swinburn, B.A., Caterson, I., Seidell, J.C., and James, W.P. (2004). Diet, nutrition and the prevention of excess weight gain and obesity. *Public Health Nutrition* 7, 123-146.

Symon, G., and Cassel, C. (1998). *Qualitative methods and analysis in organizational research*. California: Sage.

Tabachnick, B.G., and Fidell, L.S. (2001). *Using Multivariate Statistics*. 5th ed. Boston: Pearson.

Takeuchi, D. (1960). Epidimiological study on relation between dental caries incidence and sugar consumption. *The Bulletin of Tokyo Dental College* 1, 58-70.

Takeuchi, D. (1961). Epidemiological study on dental caries in Japanese children before, during and after World War II. *International Dental Journal* 11, 443-457.

Tatham, R.L., Anderson, R.E., Hair, J.F., and Black, W.C. (2006). *Multivariate Data Analysis*. 6th ed. New Jersey: Prentice Hall.

Tavakol, M., and Dennick, r. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education* 2, 53-55.

Tongco, M.D.C. (2007). Purposive sampling as a tool for informant selection. *Ethnobotany Research and Applications* 5, 147-158.

Triches, R.M., and Giugliani, E.R. (2005). Obesity, eating habits and nutritional knowledge among school children. *Revista de Saude Publica* 39, 541-547.

Tucker, K., and Sanjur, D. (1988). Maternal employment and child nutrition in Panama. *Social Science and Medicine* 26, 605-612.

Tucker, P. (1983). The Scarman report and the under-fives. *Midwife, health visitor and community nurse* 19, 436-438.

Variyam, J.N., Blaylock, J., and Smallwoos, D. (1999). Mother's nutrition knowledge and children's dietary intakes. *American Journal of Agricultural Economics* 81, 373-384.

Vereecken, C.A., Rossi, S., Giacchi, M.V., and Maes, L. (2008). Comparison of a short food-frequency questionnaire and derived indices with a seven-day diet record in Belgian and Italian children. *International Journal of Public Health* 53, 297-305.

Vermette, L., and Godin, G. (1996). Nurses' intentions to provide home care: the impact of AIDS and homosexuality. *AIDS Care* 8, 479-488.

Vue, W., Wolff, C., and Goto, K. (2011). Hmong food helps us remember who we are: perspectives of food culture and health among Hmong women with young children. *Journal of Nutrition Education and Behavior* 43, 199-204.

Wardle, J. (1995). Parental influences on children's diets. *Proceedings of the Nutrition Society* 54, 747-758.

Wardle, J. (2007). Eating behaviour and obesity. *Obesity reviews* 8, 73-75.

Wardle, J., Carnell, S., and Cooke, L. (2005). Parental control over feeding and children's fruit and vegetable intake: how are they related? *Journal of the American Dietetic Association* 105, 227-232.

Webb, G.R., Sanson-Fisher, R.W., and Bowman, J.A. (1988). Psychosocial factors related to parental restraint of pre-school children in motor vehicles. *Accident Analysis and Prevention* 20, 87-94.

White, A.H., Wilson, J.F., Burns, A., Blum-Kemelor, D., Singh, A., Race, P.O., Soto, V., and Lockett, A.F. (2011). Use of qualitative research to inform development of nutrition messages for low-income mothers of preschool children. *Journal of Nutrition Education and Behavior* 43, 19-27.

WHO (2003). *Diet, nutrition and the prevention of chronic diseases*. In: World Health Organization technical report series, pp. 1-149.

Wimmer, R.D., and Dominick, J.R. (1997). *Mass Media Research: An Introduction*. Massachusetts: Wadsworth.

Wolfe, W.S., and Campbell, C.C. (1993). Food pattern, diet quality, and related characteristics of schoolchildren in New York State. *Journal of the American Dietetic Association* 93, 1280-1284.

World Cancer Research Fund/American Institute for Cancer Research (2007). *Food, nutrition and the prevention of cancer: a global perspective*. Washington DC.

Wrigley, N., Warm, D., and Margetts, B. (2003). Deprivation, diet, and food-retail access: findings from the Leeds 'food deserts' study. *Environment and Planning* 35, 151-188.

You, W., Zhang, G., Davy, B.M., Carlson, A., and Lin, B.H. (2009). Food consumed away from home can be a part of a healthy and affordable diet. *The Journal of Nutrition* 139, 1994-1999.

Young, E.M., Fors, S.W., and Hayes, D.M. (2004). Associations between perceived parent behaviors and middle school student fruit and vegetable consumption. *Journal of Nutrition Education and Behavior* 36, 2-8.

Young, L.R., and Nestle, M.S. (1995). Portion sizes in dietary assessment: issues and policy implications. *Nutrition Reviews* 53, 149-158.

Yousefian, A., Leighton, A., Fox, K., and Hartley, D. (2011). Understanding the rural food environment--perspectives of low-income parents. *Rural and Remote Health* 11, 16-31.

Zanna, M.P., and Rempel, J.K. (1988). *Attitudes: A new look at an old concept*. In: The Social Psychology of Knowledge, D. Bar-Tal, and A. Kruglanski, eds. New York: Cambridge University Press, pp. 315-334.

Zizza, C.A., and Xu, B. (2011). Snacking Is Associated with Overall Diet Quality among Adults. *Journal of the American Dietetic Association* 112, 291-296.

Section 8

Appendices

Section 8: Appendices

Appendix 1 Participants information sheet, consent form and Questionnaire



Dental Health Services & Research Unit



PARTICIPANT INFORMATION SHEET

Families and Food

You are invited to take part in a Postgraduate Research Study exploring factors influencing food choices in families with young children in Scotland.

This information sheet tells you what the study is about and what your role will be if you decide to take part.

What is the purpose of this study?

The purpose of this study is to explore what influences family food choices.

Why have I been chosen?

We are asking parents with children aged 2-5 from the Tayside area to participate.

What would I have to do?

If you decide to take part in the study, Sheela Tripathy will provide you with a questionnaire about your food choices for your children. You will be asked about your family's eating habits, your food choices and your views about food and healthy diet, particularly relating to any children aged 2-5 years.

Will all the data collected be confidential?

Yes. All the data will be electronically stored in a password protected computer within the research unit. Only the research team will have access to the documents. No one will be able to link the information you provide to your identity or name. The paper copies of the questionnaire will be destroyed after 5 years.

Do I have to take part?

No. It is up to you. You will also be able to withdraw from the study at any point without giving any explanation. If there are any questions you do not wish to answer, please feel free to say so.

Risks

There are no known risks for you

Cost and Compensation

Your participation in this study is voluntary. There is no cost or payment involved.

Will I find out about the results of the study?

Yes. When the research is complete, we will send you a short report on request.

How do I find out more about the study?

If you want to know more about the study please contact;

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This is a postgraduate research project. The University Research Ethics committee of The University of Dundee has reviewed and approved this research study.

THANK-YOU FOR TAKING THE TIME TO READ THIS INFORMATION SHEET AND FOR CONSIDERING TAKING PART IN THIS STUDY.

CONSENT FORM**Families and Food**

The purpose of this research project is to explore the family food choices in relation to young children. By signing this document you are agreeing to participate in the study, and have read and understood the Participant Information Sheet.

Participant's signature

Date

Participant's Name

Printed name of person obtaining consent

Signature of person obtaining consent

FAMILIES AND FOOD

PARENTS' QUESTIONNAIRE

This questionnaire is about your children, the food they eat and the recommended diet for healthy lifestyles

I would be grateful if you would please answer a few questions about your children, their food and eating habits. When you are completing the questionnaire please will you think about your children aged 2-5.

These questions are NOT a test – I am only interested in what you think.

ALL YOUR ANSWERS WILL BE TREATED CONFIDENTIALLY



The following section is about you and your family.
Please tick ☒ your answer and complete as appropriate.

a. How many children do you have between the ages 2 -5?

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

b. How old are your children?

1st child: _____

2nd child: _____

3rd child: _____

4th child: _____

5th child: _____

c. Are you the child's:

Mother ☐ Father ☐

Other ☐

d. Are you:

Single ☐

Married/ Cohabiting ☐

Separated/ Divorced ☐

Widowed ☐

e. What is your ethnic background?

White ☐

Black Caribbean ☐

Black African ☐

Indian/Pakistani/Bangladeshi ☐

Chinese ☐

Any other ethnic group ☐

.....

f. How old are you?

16 to 25 years ☐

26 to 35 years ☐

36 to 45 years ☐

46 years and over ☐

g. What is the highest level of education you have completed?

Primary school ☐

Secondary school ☐

College ☐

University ☐

Still studying ☐

h. Do you have a qualification in health or nutrition?

Yes ☐

No ☐

If yes please specify your qualification _____

i. Are you:

Employed full time ☐

Employed part time ☐

Unemployed ☐

Full time parent ☐

Student ☐

Disabled or too ill to work ☐

j. Does your child/children spend most of their day time with:

Mother ☐

Father ☐

Grandparent ☐

Nursery/Child-minders ☐

k. Please state your postcode:

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The following questions are about the recommended healthy diet
Please circle the answer that applies best for you and your children.

Experts recommend that children have the following:

- 5 or more portions of fruit and vegetables each day
- Wholegrain food (wholemeal bread, wholemeal pasta, brown rice)
- Sweet food only once or twice a week
- No sweet food or drinks between meals
- Crisps or corn snacks no more than twice a week and only as part of a meal
- Processed food/ready meals/takeaway food infrequently (e.g. once or twice per week)

Do you intend to provide the diet recommended above for your child this week?

Definitely not	Quite unlikely	Slightly unlikely	Neither/nor	Slightly likely	Quite likely	Yes definitely
1	2	3	4	5	6	7

How easy will it be for you to provide the diet recommended above for your child this week?

Extremely hard	Quite hard	Slightly hard	Neither/nor	Slightly easy	Very easy	Extremely easy
1	2	3	4	5	6	7

How important is it to provide the diet recommended above for your child this week?

Not at all important	Quite unimportant	Slightly unimportant	Neither/nor	Slightly important	Quite important	Extremely important
1	2	3	4	5	6	7

How willing are you to provide the diet recommended above for your child this week?

Not at all	Quite unlikely	Slightly unlikely	Neither/nor	Slightly likely	Quite likely	Yes Definitely
1	2	3	4	5	6	7

How likely is it that by providing the diet recommended above for your child this week will?

	Very unlikely	Quite unlikely	Slightly unlikely	Neither/nor	Slightly likely	Quite likely	Very likely
Help to control your child's weight	1	2	3	4	5	6	7
Give your child more energy	1	2	3	4	5	6	7
Improve your child's behaviour	1	2	3	4	5	6	7
Help your child to stay healthy	1	2	3	4	5	6	7
Help your child to enjoy their food	1	2	3	4	5	6	7
Prevent your child becoming obese	1	2	3	4	5	6	7
Prevent your child getting tooth decay	1	2	3	4	5	6	7

How important is it to you personally that by providing the diet recommended above for your child this week will?

	Not important at all	quite unimportant	Slightly unimportant	Neither nor	Slightly important	Quite important	Very important
Help to control your child's weight	1	2	3	4	5	6	7
Give your child more energy	1	2	3	4	5	6	7
Improve your child's behaviour	1	2	3	4	5	6	7
Help your child to stay healthy	1	2	3	4	5	6	7
Help your child to enjoy their food	1	2	3	4	5	6	7
Prevent your child becoming obese	1	2	3	4	5	6	7
Prevent your child getting tooth decay	1	2	3	4	5	6	7

If I gave the recommended diet to my child:

	Very Unhappy	Unhappy	Slightly unhappy	Neither/nor	Slightly happy	Quite happy	Very happy
My child would be	1	2	3	4	5	6	7
My partner would be (if applicable)	1	2	3	4	5	6	7
People in my family would be	1	2	3	4	5	6	7
Health professionals I know would be	1	2	3	4	5	6	7

How strongly does your partner/husband believe that by providing the diet recommended above for your child this week will?

	Does not believe at all	Does not believe	Does not quite believe	Neither/nor	Slightly believe	Quite strongly believe	very strongly believe
Help to control your child's weight	1	2	3	4	5	6	7
Give your child more energy	1	2	3	4	5	6	7
Improve your my child's behaviour	1	2	3	4	5	6	7
Help your child to stay healthy	1	2	3	4	5	6	7
Help your child to enjoy their food	1	2	3	4	5	6	7
Prevent your child becoming obese	1	2	3	4	5	6	7
Prevent your child getting tooth decay	1	2	3	4	5	6	7

How strongly do your family believe that by providing the diet recommended above for your child this week will?

	Do not believe at all	Do not believe	Do not quite believe	Neither/nor	Slightly believe	Quite strongly believe	Very strongly believe
Help to control your child's weight	1	2	3	4	5	6	7
Give your child more energy	1	2	3	4	5	6	7
Improve your my child's behaviour	1	2	3	4	5	6	7
Help your child to stay healthy	1	2	3	4	5	6	7
Help your child to enjoy their food	1	2	3	4	5	6	7
Prevent your child becoming obese	1	2	3	4	5	6	7
Prevent your child getting tooth decay	1	2	3	4	5	6	7

Thinking about providing the diet recommended above for your child this week, how often do you feel?

	Always	Very often	Quite often	Not often	Some times	Rarely	Never
I do not have enough time to give my child the recommended diet	1	2	3	4	5	6	7
Giving my child the recommended diet costs too much money	1	2	3	4	5	6	7
Giving my child the recommended diet is inconvenient	1	2	3	4	5	6	7
I don't know which foods are necessary for the recommended diet	1	2	3	4	5	6	7
Giving my child the recommended diet means having arguments with my child that I would rather avoid	1	2	3	4	5	6	7
Giving my child the recommended diet means that I have to cook	1	2	3	4	5	6	7
Giving my child the recommended diet does not matter because they choose their own food	1	2	3	4	5	6	7
I don't have skills to cook the recommended meals	1	2	3	4	5	6	7

Thinking about providing the diet recommended above for your child this week, how likely is it that the following will influence you providing this recommended diet?

	Very Unlikely	Quite unlikely	Slightly unlikely	Neither/ nor	Slightly likely	Quite likely	Very likely
Not having enough time	1	2	3	4	5	6	7
Costing too much money	1	2	3	4	5	6	7
Inconvenience of preparing food	1	2	3	4	5	6	7
Not sure if these are healthy foods and drinks for my child	1	2	3	4	5	6	7
Arguing with my child about what they will be eating	1	2	3	4	5	6	7
Having to cook the food	1	2	3	4	5	6	7
Not having the skills to cook the food	1	2	3	4	5	6	7

How strongly do you agree with the following statements?

	Strongly disagree	Disagree	Slightly disagree	Neither/ nor	Slightly agree	agree	Strongly agree
I think of myself as a "healthy eater"	1	2	3	4	5	6	7
My principles dictate that I should give my child the recommended diet	1	2	3	4	5	6	7
I feel obliged to give my child the recommended diet	1	2	3	4	5	6	7
It is morally wrong to give my child an unhealthy diet	1	2	3	4	5	6	7
I would feel guilty if I gave my child an unhealthy diet	1	2	3	4	5	6	7
I am concerned about the health consequence of what my child eats	1	2	3	4	5	6	7

Generally speaking, do you want to do what:

	Strongly disagree	Disagree	Slightly disagree	Neither/ nor	Slightly agree	agree	Strongly agree
Your partner/husband believes you should do	1	2	3	4	5	6	7
Your family believes you should do	1	2	3	4	5	6	7
Makes your child happy	1	2	3	4	5	6	7
Health professionals you know believe you should do	1	2	3	4	5	6	7

**The following section is about the food we eat as part of our regular meals.
Please Circle the answer that you think is most appropriate to you.**

Saturated fat are mainly found in:	Vegetable oil	Dairy Product	Both	Not sure
Which of these breads contain the most vitamins and minerals?	White	Brown	Wholegrain	Not sure
Which do you think has the higher calories?	Butter	Regular Margarine	Both the same	Not sure
Which of these has the most calories for the same weight?	Sugar	Fat	Fibre	Not sure

	Agree	Disagree	Not sure
Brown sugar is a healthy alternative to white sugar	1	2	3
There is more calcium in a glass of whole milk than in a glass of semi skimmed milk	1	2	3
A glass of unsweetened fruit juice counts as a helping of fruit	1	2	3

a. Do you think the following help reduce the chances of being overweight?

	Yes	No	Not sure
Eating more fibre	1	2	3
Eating less saturated fat	1	2	3
Eating less salt	1	2	3
Eating more fruit and vegetables	1	2	3
Eating less preservatives/additives	1	2	3
Drinking fewer sugary soft drinks	1	2	3

b. Do you think the following are high or low in added sugar?

	High	Low	Not sure
Bananas	1	2	3
Cheese	1	2	3
Ice-cream	1	2	3
Orange squash	1	2	3
Tomato ketchup	1	2	3

c. Do you think the following help prevent tooth decay?

	Yes	No	Not sure
Eating more fibre	1	2	3
Eating less sugar	1	2	3
Eating less fat	1	2	3
Eating more fruit and vegetables	1	2	3
Eating sugar less often	1	2	3

d. Do you think the following are high or low in fat?

	High	Low	Not sure
Pasta (without sauce)	1	2	3
Low fat spread	1	2	3
Baked beans	1	2	3
Cold meat	1	2	3
Honey	1	2	3
Scotch egg	1	2	3
Nuts	1	2	3
Bread	1	2	3
Cottage Cheese	1	2	3

Please turn over to the last page

The following questions are about choosing healthier alternative of food items. Please tick the box that you think is appropriate (regardless of whether you personally like or dislike the food).

a. Choose a food that would be the best choice for a low fat, high fibre snack?

- | | |
|---|--|
| <input type="checkbox"/> Diet strawberry yogurt | <input type="checkbox"/> Raisins |
| <input type="checkbox"/> Muesli bar | <input type="checkbox"/> Wholemeal crackers and cheddar cheese |

What kind of a sandwich do you think is healthier?

- | |
|--|
| <input type="checkbox"/> Two thick slices of bread with a thin slice of cheddar cheese filing |
| <input type="checkbox"/> Two thin slices of bread with a thick slice of cheddar cheese filling |

b. If a person wanted to reduce the amount of fat in their diet but didn't want to give up chips, which one would be the best choice?

- | | | |
|--|---|--|
| <input type="checkbox"/> Thick cut chips | <input type="checkbox"/> Thin cut chips | <input type="checkbox"/> Crinkle cut chips |
|--|---|--|

c. Many people eat spaghetti bolognese. Which do you think is healthier?

- | |
|--|
| <input type="checkbox"/> A large amount of pasta with a very little sauce on top |
| <input type="checkbox"/> A small amount of pasta with a lot of sauce on top |

d. If a person felt like eating something sweet but was trying to cut down on sugar, which of the following would be the best choice?

- | | |
|---|---|
| <input type="checkbox"/> Honey on toast | <input type="checkbox"/> A cereal bar |
| <input type="checkbox"/> Plain digestive biscuits | <input type="checkbox"/> Banana with plain yogurt |

e. Which of these would be the healthiest pudding?

- | | |
|--|--|
| <input type="checkbox"/> Baked apple | <input type="checkbox"/> Wholemeal crackers and cheddar cheese |
| <input type="checkbox"/> Strawberry yogurt | <input type="checkbox"/> Carrot cake with cream cheese topping |

f. If a person wanted to reduce the amount of salt in their diet, what would be the best choice?

- | | |
|---|--|
| <input type="checkbox"/> Readymade frozen shepherd's pie | <input type="checkbox"/> Gammon with pineapple |
| <input type="checkbox"/> Stir fry vegetables with soy sauce | <input type="checkbox"/> Mushroom Omelette |

Thank You for completing the questionnaire

Appendix 2 Ethical approval



School of Psychology

University of Dundee Research Ethics Committee

Sheela Tripathee,
Dental Health Services and Research Unit,
University of Dundee,
DD2 4BF.

14 June 2012

Dear Ms Tripathee,

Application Number: UREC 12068x

Title: Families and Food.

Your application has been reviewed by the University Research Ethics Committee, and there are no ethical concerns with the proposed research. I am pleased to confirm that the above application has now been approved.

You submitted the following documents:

1. S_tripathee_ethics application form_Quantitative
2. S_tripathee Msc_questionnaire_11_6_12
3. S_Tripathee_DHSRU_Ethics_documents_Quantitative_11_06_12

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Peter Willatts'.

Dr Peter Willatts
Chair, University of Dundee Research Ethics Committee